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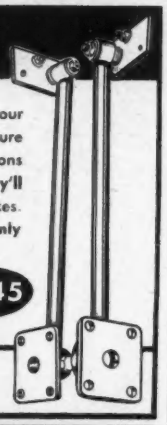

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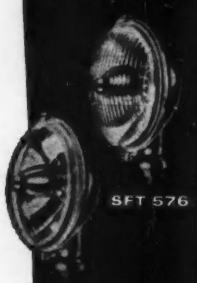

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NEXT MONTH

Ferrari and His Fantastic Cars
Road Tests of Pontiacs, Dodges
Splash your Car With Color!

VOL. 10, NO. 1

MOTOR TREND

THE COVER: Action shots of the "popular three." Chevy photo by GM Photographic, Ford by Dean E. Witt, Plymouth by Bob D'Olivo. See page 52 for road test reports.

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(Advertisement)

McCulloch Supercharger Tips

by John Thompson

Our postman has been kept busy lately delivering letters from readers who've asked about the difference between the new McCulloch VR (variable ratio) supercharger and its popular predecessor of the past few years.

Well, the most apparent difference—at least on the outside—is that the new VR blower is more compact and thus can fit more easily into a limited area. At the same time, though, its capacity is higher than before as a result of some special engineering advances.

The McCulloch supercharger of yesteryear operated by means of a variable speed pulley. This required a proper geometric relationship between the drive pulley and idler pulley and, of course, made it a pretty tough installation for the layman.

On the new VR blower, the variable speed ratio is controlled inside by the engine oil pressure rather than by the supercharger air pressure. This makes for steadier, more positive control. Incidentally, installation problems have been minimized, too, with this compact new unit. For the time being, the new VR blower will be available only for '58 model cars and custom installations.

The Northwest timber country was the scene recently of a dramatic test of supercharged versus non-supercharged vehicles. Jim Flanagan, McCulloch supercharger distributor in Portland, Ore., conducted a special 20-mile test for the owner of a big logging operation. Identical Reo V-8 logging trucks were used—one with supercharger and one without.

After 20 miles, the supercharged truck was five miles ahead of its unblown competitor. The driver reported "easier, more powerful acceleration on hills and much less down-shifting" as a result of Flanagan's custom McCulloch supercharger installation.

NEW CAR DEPT.—McCulloch superchargers are now available for the '58 Chevrolet and Corvette. This brings to six the number of new cars on which the VR blower can be installed. Edsel, Ford, T-Bird and Mercury all were announced earlier.

Speaking of Chevy, the '57 Belair owned by McCulloch's Denver distributor, John Bandimere, took top honors in the recent Hot Rod magazine sponsored acceleration trials. Equipped with a fuel injection Corvette engine and new McCulloch VR blower, Bandimere's Chevy went from 0 to 60 mph in just 6.7 sec., while carrying four passengers!

If you want to know what a McCulloch supercharger can do for your car in boosting horsepower, acceleration and top speed, just write to me for the full particulars. Tell me the year and make of your car as well as the power equipment you have. I'll send you a free illustrated folder, together with the price and the name and address of your nearest McCulloch dealer. Write to John Thompson, Paxton Products, 929 Olympic Blvd., Santa Monica, Calif.

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from the editor

Quick Glimpses of Europe

OUR SECOND ANNUAL SHOW ISSUE takes on added significance this year with the inclusion of coverage on the newest imported cars. The reason is fairly obvious when you consider the fact that foreign cars are taking up a share of the market occupied until a short time ago by the U.S. independents, which makes them extremely important in any overall look at the car market.

In our view there are two different ways of getting this overall look—one is by seeing all cars together under one roof so you can compare them side by side, and the other is by reading about their most significant features in MOTOR TREND. When you can do both, so much the better.

This *is* just what you can do: see the show that ranks as the country's greatest new car show, the Golden Jubilee Auto Show put on by the Chicago Automobile Trade Association at the International Amphitheater during January 4-12; and, gain some added knowledge (we hope) about the cars on exhibit there by reading the articles in this Show Issue of MT.

To give us added insight into the future imported car market, before preparation of this issue the publisher and I winged our way overseas on a Pan-American Super Clipper. There we made a whirlwind four-week tour of Britain and the Continent. In between visiting two international auto shows, the one at Earls Court in London and the other at Turin, Italy, we visited factories in Britain, Germany, Italy and France. From this visit we believe that we have helped, and can continue to help, bring about a much greater understanding of problems, motives and ultimate desires on both sides of the Atlantic. Though we are brimming with information, it is impossible to give anything here but a surface skimming of the things we have learned. Here are a few:

AN AMERICAN'S first feeling in England (and more specifically London) is that everything is on a much smaller scale: the roads, the cars, even houses. With practically *all* cars being small, and having little space in which to maneuver them, it's apparent why the cars are small. And unless something drastic happens to widen the almost universal two-lane streets and highways, there is little reason to expect British cars to get any larger. Too many factors contribute to the smaller cars—narrow roads with dense traffic, the economy of operating a small car, the periodic war scare, and subsequent gas rationing.

Though the narrow streets and narrow (most generally two-lane) winding roads are jammed with the traffic of cars, trucks, scooters, motorcycles, tricycle-type trucks, and cyclists day *and* night, a Britisher's interest in cars runs extremely high. Thousands of persons flock to Earls Court on opening day, even though the first day's ticket is marked up to £1 ($2.80). Used car prices, especially for the rarer vintage or veteran cars, are comparable to new cars. This probably partly explains the good condition of most old cars.

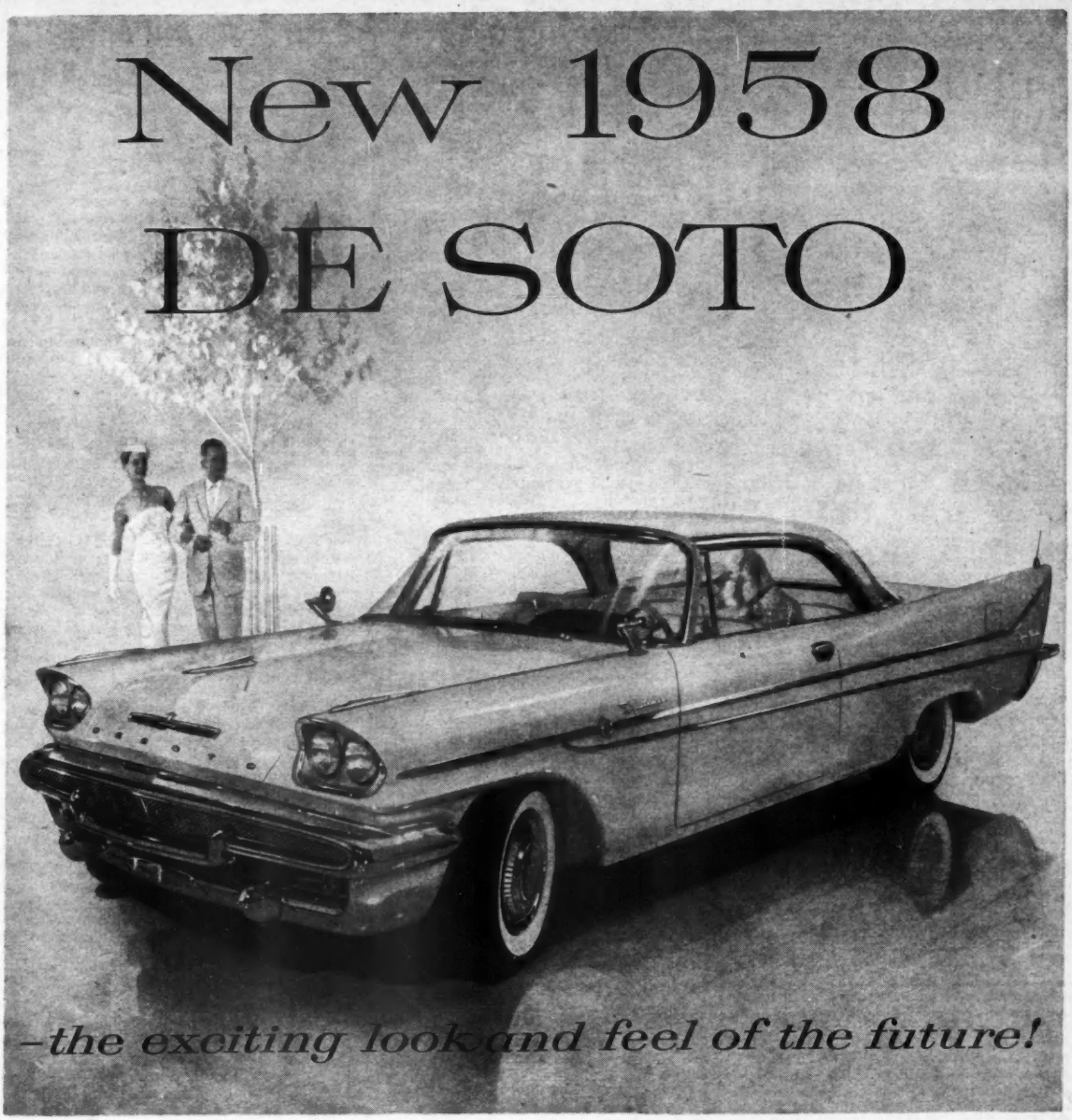
WEST GERMANY has made an almost unbelievable recovery since the war. Today Volkswagens, Opels, Mercedes, Porsches, DKWs, BMW-Isettas, and a few foreign makes (notably Fiat) are crowding the streets and highways to an extent unparalleled in German history. Autobahns (wide, divided four-lane expressways) lace the entire country, enabling you to make distances in half the time it would take on the narrow connecting roads.

Interest in cars and racing is much higher in Germany than in the States. The Frankfort Auto Show (held once every two years) drew 800,000 persons in 10 days. Even in Stuttgart, where Mercedes cars are built, you would expect the citizenry to be fairly blasé about the 300-SL roadster. Not so. Everywhere the publisher drove his, people stopped to look, and when he stopped, they gathered around. It seems to be wrapped up in an appreciation of things mechanical, with this same feeling being evidenced in their cars and the way they build them.

The largest producer of cars in Italy, naturally, also has the greatest number of cars on the streets and roadways of that country. Taxis, cars, trucks and busses almost invariably bear the Fiat nameplate. Over 85 per cent of Italian cars today are Fiat-made, though the town where the annual International Salon is held and where Fiat is built today, once was known as "the Detroit of Italy." At one time, as many as 15 different marques were produced there. Now the only other major producer in Turin is Lancia.

The Italian man on the street has a burning interest in cars, especially when you consider that the ownership of a car entails a prohibitive cost. It's not as much the initial outlay for the car, but the fact that one liter of gasoline costs him 140

continued on page 10



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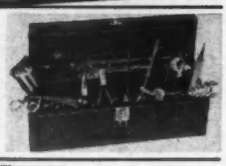

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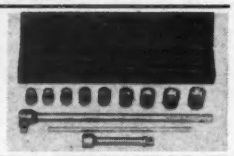

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LETTERS

THE FORGOTTEN MAN

Dear Editor:

I am the man the motor companies have forgotten—I am the man over 60. I don't want to go 0-60—my top speed is 45. I don't want to go 50-80—for the same reason. I don't want overhead valves—they rattle. I don't want V engines—they gum up. I don't want 56-inch height—I wear a hat. I don't want passing speed—everything passes me. I want washable seats—my grand-daughter's feet are dirty, and so are the dog's. I want a good heater—the dog is hairless, and so am I. I want 13 miles to a gallon. I want 40,000 miles to a set of tires. I want the car to start when I push the button. I want a comfortable ride and seats. I want medium price.

Niels Peterson — Westminster, Md.

AN EX-"TOTAL LOSS"

Sirs:

After a visit to an insurance adjuster to purchase what they called a total loss, I finally found the wrecked car I was looking for—a

1956 Dodge with PowerFlite transmission. My goal was to supply a need at the garage for a pickup and to have something different.

Five months and several hard-earned knocks later—here it is.

This creation is 100 per cent Dodge—some of the parts date back to 1948, but there is nothing on it foreign to its breed. It has won no prizes and never will, but it is quite an eye-catcher.

Merritt Willhite — Grant City, Mo.

THAT MAN'S BACK AGAIN!

Dear Sir:

On page 56 of February 1954 MOTOR TREND in the article on the then-new Buick, you folks were happy because "Whoever the Flint stylist was who used to lay chrome on with a trowel must no longer be on the payroll."

Well, gentlemen, after seeing the 1958 Buick, I am sorry to report that *he* is back—with a scoop shovel.

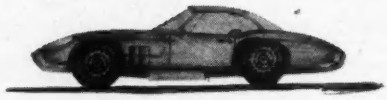
Donald C. Nelson — Elk River, Minn.

DUAL-PURPOSE SPORTS CAR

Sirs:

My "dream car" will have an engine of from three to four liters capacity, torsion bar or any other good independent suspension on all four wheels, over 20 mpg, unitized body and frame, a rear-mounted transmission with a swing axle, the dimensions of a 1957 Rambler. It must have quick steering, large and efficient brakes, and it must be of exceptionally good styling.

I am enclosing a sports car design that unfortunately looks like a cross between a



Corvette, Mercedes and Ferrari (what a car that would make!).

The design stems from the fact that I think most sports cars lack either adequate bumper protection for street use, or when these cars have the proper-sized bumpers, they interfere with aerodynamics of the design. You will note that the bumpers of my creation are large and offer good protection, but they still are flush with the body lines.

Paul Kilb — New York

AN AMERICAN IN VIET NAM

Gentlemen:

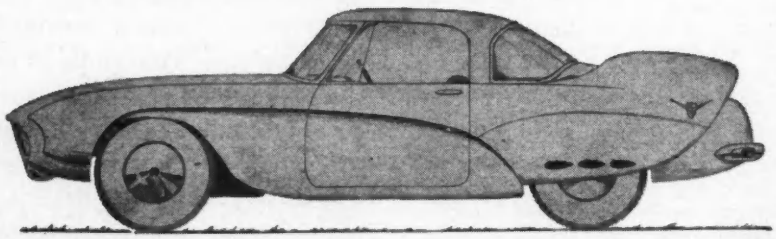
I am an American engineer in Saigon, Viet Nam. I have been here six months. I thought you might like to know something about automobiles that are used in the tropics.

But first off let me say that Jim Butler's custom sensation (Sept. MT) is the best-looking job I have yet seen in your magazine. It seems most difficult for Americans to come up with a good-looking grille, something simple, graceful with a minimum of chrome, and something good-looking. I do think the rear is a little overdone.

From the standpoint of number, there are more little Renaults here than everything else combined. They are used for taxis. They must be good to stand up under their treatment here. Also they cost less, take little gas and are easy to repair.

American cars rate very high here. As in the U.S., Fords, Chevrolets and Plymouths predominate. More Studebakers, proportionately speaking, are seen here than in the States. There are also Buicks, Oldsmobiles, Chryslers, Dodges, Pontiacs, Ramblers, etc., and perhaps three or four New Yorkers and a half-dozen Cadillacs. I have seen one T-Bird —no Corvettes nor any Rolls-Royces.

Ray I. Hess — Saigon, Viet Nam



TWO CENTS' WORTH

Dear Sir:

I would like to throw in my two cents' worth for a personal car with a 102-inch wheelbase. It is 52 inches high and uses a T-Bird or modified '40 Ford frame.

Rolff Patterson — Charlotte, N.C.

WHY NOT?

Dear Sir:

Why not put those fins on the new cars to work? If they were made just a little

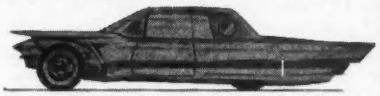
larger and more on the idea of a vertical stabilizer with a rudder controlled by the power steering, they would be of help in controlling the car in heavy winds and at high speeds.

Dr. H. L. Lee — Las Vegas, Nev.

"IDEA CAR"

Dear Sirs:

I am sending along a drawing of one of my own creations. This car incorporates butterfly doors, a possible gas turbine and a hint of side sculpture. It could be made in a



variety of models, including station wagons, convertibles and two- and four-door hardtops.

John Herlitz — Pine Plains, N.Y.

ON WITH THE DEBATE

Gentlemen:

I disagree with Mr. Fellowes in "The Great Debate." I have seen and ridden in a number of foreign cars, and I can't say I enjoyed them. I truthfully used my hands to straighten out my legs as I got out of the "capacious" rear seat after a short ride, and I'm only five feet four inches! Also, not only are Americans slightly larger than most foreigners, they like their comfort and can afford a large car.

Seems to me American cars possess good style and comfort, Germany goes for engineering with badly planned bodies, while the majority of British cars fail to produce a good combination of style and engineering.

Stephen H. Kaiser — Millstone, N.J.

THIS IS PROGRESS?

Gentlemen:

It seems to me that the buying public will take anything with four wheels that runs and is backed by good advertising and that the main reason for present designs from Detroit is the designers' narrow preoccupation with progression towards jet age designs (i.e. tail fins) that are neither practical nor good looking. It is their wish for scooping frontal areas, for greatness in size as an end in itself, for power assists, for soft rides, for more cubic inches, for gas turbines—and they call it progress and will have convinced the people that it is good.

In this light, I'm glad there is an increasing number of sports car organizations.

Carl R. Goodwin — Delaware, Ohio

ONLY BECAUSE THEY'RE IMPORTED

Dear Sirs:

May I answer the redundant editorial question of "Why doesn't Detroit wake up and build a small economy car like the VW, since so many Americans are buying such imports?"

My answer is that Detroit realizes that Americans are buying such imports only because they are imports. Can you imagine an American buying anything as ugly as the VW sedan if it were made in America?

As for me, my auto ego became full-grown this year when I, an AMERICAN, purchased from a GREEK dealer in WEST AFRICA a Karmann-Ghia designed by an ITALIAN and built in GERMANY which I immediately drove through FRENCH Togoland to BRITISH Ghana.

Bing Grindle — Nigeria, West Africa

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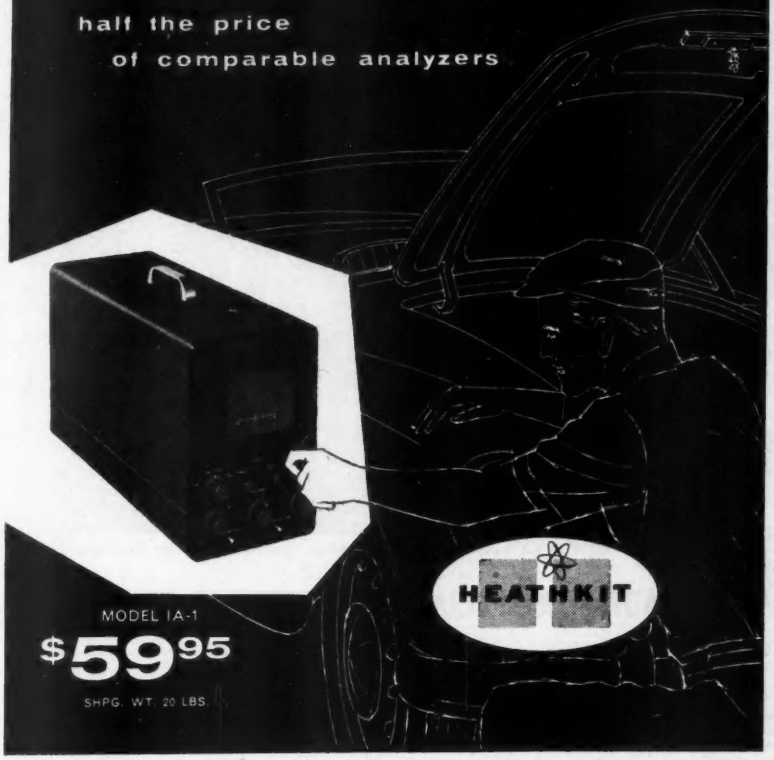

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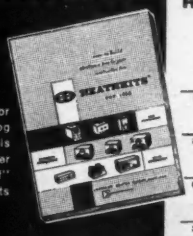

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MODEL 200

Automatic FAN RELEASE

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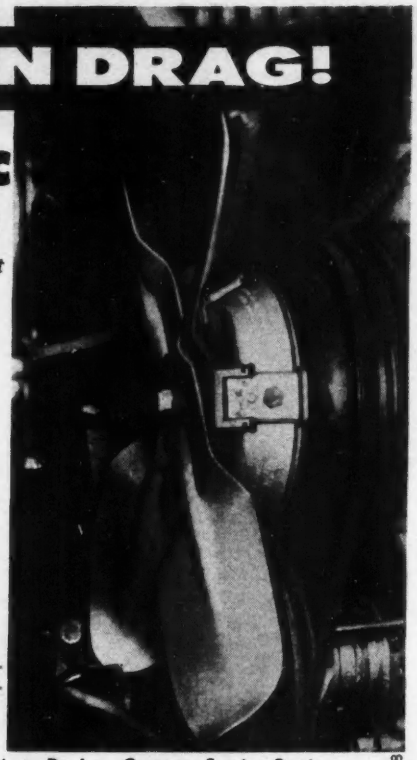

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- **Acceleration** up to 10% . . . in official tests conducted at Indianapolis Speedway by U. S. Auto Club.

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FOXCRAFT PRODUCTS * Huntingdon Valley, Pa.

MEMO from the editor

continued from page 6

lira, equivalent to $.95 per gallon. And so everywhere you see scooters and bicycles in much greater proportion than cars.

Though the roads, outside of the Autostradas (like the Autobahns of Germany) are built barely wide enough and as serpentine as possible, fast is the way the Italian likes to drive. With his small car, eminently adapted to these roads, it's easy.

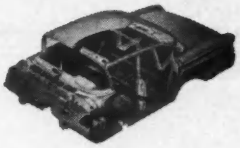
France is the real paradox when it comes to her cars. Once the proud producer of massive, powerful cars like Bugatti, Delage, and Delahaye, these have virtually disappeared from the streets. The reason is the same as in Britain—the high cost of gasoline (95 francs per liter or $.99 per gallon) and exorbitant taxes. The more powerful the car, the higher the taxes. The Simca Vedette, costing 995,000 francs ($2369) has a tax horsepower rating of 13, making it subject to a super luxury tax of 15,000 francs ($36) *per year*, which is *on top of* a registration fee for the first year only of 15,400 francs ($37). This isn't bad, but if that same car had a slightly larger engine, taking it up to a 15 horsepower rating, the luxury tax *per year* would then skyrocket to 100,000 francs ($238)!

This is the best explanation in the world for small cars and minicars becoming the order of the day in France. It's also a good way to keep down U.S. imports.

Frenchmen have a high interest in cars, as evidenced by the large attendance at the annual Paris Salon. Yet, when you watch cars scoot down the Champs Elysée, or around the two circles at each end, the Place de la Concorde and the Arc de Triomphe de l'Etoile, you wonder. Anyone driving his proud possession through this maze for the first time would cringe at the numerous times he misses having a fender rended off. The Frenchman, it seems, drives with a glint in his eye that says, "If you can bluff me, *c'est la vie!*"

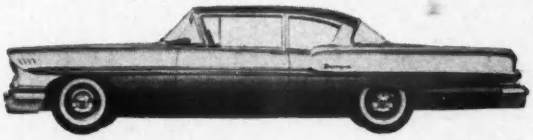
Leaving these four European countries behind and returning to the U.S. to drive a '58 Chevrolet on the streets and freeways of Los Angeles, our feelings were mixed. Though the manufacturers in foreign countries would like to increase their exports to this country, they all well realize that they must first build *their* cars for *their* country, just as they know that U.S. manufacturers build their cars for the American public. When, of course, you can build the most popular car for your country and by chance it also becomes highly acceptable overseas (as in the case of Volkswagen and Renault), you have an added bonus. On the other hand, European manufacturers have no illusions about their cars replacing the Chevy and Ford in popularity here. And neither do we.

Stunning new interiors feature lavish new colors and patterns in handsome nylon-faced fabrics and vinyls!



New body design, with new Safety-Girder frame, means a more solid feel on the road!

Biggest, boldest move any car ever made! There's never been a model change to match this one... never a car with so many bold new ideas about driving pleasure! This is just a sample —a few of all the things that are new in the...



New length and lowness, with flowing Sculpturamic styling, greater glass area front and rear!

'58 CHEVROLET

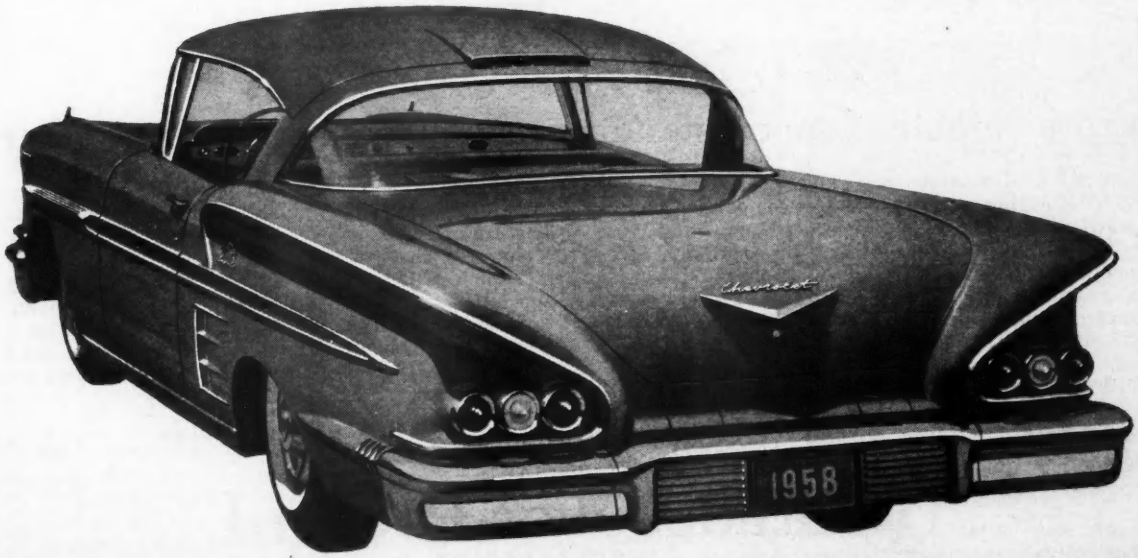
New dual headlamps put more light where you need it for better seeing and safer night driving.

New Full Coil suspension at all four wheels means a smoother ride on any road!

A radical new V8 Chevy's new Turbo-Thrust V8 even looks different. You can bet it's livelier, too!

New Level Air suspension It's the latest development in automobile suspension! An extra-cost option.

GM 1908 1958 FORWARD FROM FIFTY



The new Impala Sport Coupe in the Bel Air Series.

Chevrolet Division of General Motors, Detroit 2, Mich.

The 300 SL Roadster

A rare combination: outstanding road performance plus luxury

The new 300 SL Roadster bears a very close design kinship to the highly successful 300 SLR competition sports car and the 2.5 liter W 196 Mercedes-Benz Grand Prix car. The addition of compensating springs on the 300 SL's single joint rear swing axle results in handling and cornering characteristics of a very high order. Proper use of power and steering will take the 300 SL Roadster through difficult corners at high competition speeds. The space frame is redesigned to accommodate conventional doors, and flexibility of the 250 hp fuel injection engine is such that *smooth* acceleration from 15 mph in top gear to maximum speed is easily achieved. Actual overall performance of the 300 SL Roadster is what you would expect: *Outstanding!*

However, what you would not ordinarily expect in a car of such high performance are the luxurious seats and appointments you find in the 300 SL Roadster. Roll-up windows and a snug, truly all-weather top that goes up in seconds, extremely comfortable leather bucket seats and a redesigned instrument nacelle for instant reading are some of the features.

Mercedes-Benz motor cars are distributed exclusively in the U. S. by the Studebaker-Packard Corporation and are sold and serviced by Studebaker-Packard dealers.

Studebaker-Packard
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SPOTLIGHT ON DETROIT

by Joe H. Wherry Detroit Editor

FORD'S NEW THUNDERBIRD will have a new concept, and be introduced at an as-yet-undisclosed date this winter. Best guess is that the new four-passenger, enlarged car will make its public debut around the end of January. As this is written, the current two-seater Birds are just being wound up on the production line.

WE CAN SAY that the new Bird will seat four in cozy, bucket-type seats, that it will have a wheelbase of 113 inches, that there will be more headroom, more ground clearance, four cubic feet more trunk capacity, and that all sorts of power options will be available. The new sports-*type* car will have an overall height of just 52 inches, same as previously, but will be *longer* and *wider:* 205.4 and 75.4 inches respectively.

THUNDERBIRD STYLING will be like that of the Continental Mark II, shrunken somewhat of course, but having that long, low, expensive look. Cost? More expensive than now—how much more we don't know. We examined the new job at a recent press preview where cameras were not allowed, sat in it, liked the front seat and controls, but are a bit curious as to why a luxury car has to have such a restricted rear seat legroom. The hood was locked, but we have reason to believe that engines will include those with displacements approximating FoMoCo's largest—or close to 400 cubic inches.

THE NEW RAMBLER "AMERICAN" with 100-inch wheelbase seems destined, if the enthusiasm shown by the press at a recent closed showing is an indication, to prove mighty popular. The car, a two-door sedan, is a modernized carbon copy of the '55 Rambler—with a new grille, rear wheel cutouts to complement the front, and a few engine modifications that include a conventional water pump location, 12-volt ignition, higher compression, on the familiar L-head six-cylinder engine. The "American" does drive out real nicely and we think it will be the answer to the prayers of many who want economy.

ARGONAUT, that elusive super car, has been ready in prototype form in one way or another, has undergone numerous changes, has been kept so closely under wraps that no one has been allowed to see it. Informants now tell us that further changes are being accomplished, that another new body is being prepared, that the car will be ready for introduction at the secretly located Cleveland, Ohio plant sometime after January.

THIS MUCH WE KNOW if we can believe what we have been told: the car will be over $12,000, will be a low-production custom-built affair with an undercarriage closely related to that of the Chrysler with 127-inch wheelbase, will have an engine displacing at least 392 cubic inches, and that the frame beneath the European-built, aluminum body will be of tubular design.

DESIGNED TO LAST at least a decade, the Argonaut is described as a "man's roadster" with strength factors not before achieved. Weight will be around 5000 pounds perfectly (we hear) balanced with a 50-50 front and rear weight distribution. This is said to make power steering unnecessary. A new power brake system incorporating two-stage aluminum master cylinder is to be employed. The Argonaut Company appears to be well-heeled, has a staff of brass, will make many of the parts in their own shops but will purchase the engines and some other components in Detroit and elsewhere.

IS THIS "DART" the next Imperial? We wonder, inasmuch as the wheelbase is the same as the Imperial's. Virgil Exner, Chrysler's vice-president of styling, and Bill Schmidt, his executive stylist, have been giving the Dart increased attention. Actually this baby is a laboratory on wheels and, from all accounts, appears to be the test vehicle for determining many features likely to show up on cars in the future—possibly the near future.

SAYS VIRGIL EXNER in this connection: "We are continuing wind tunnel and performance tests to learn ways of further improving appearance; to ob-

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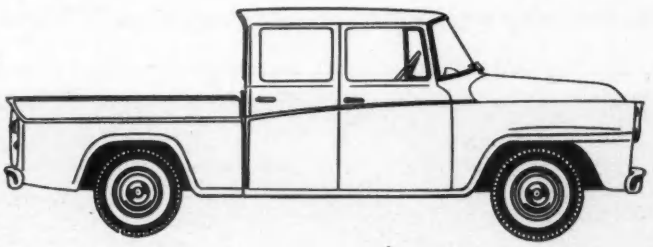
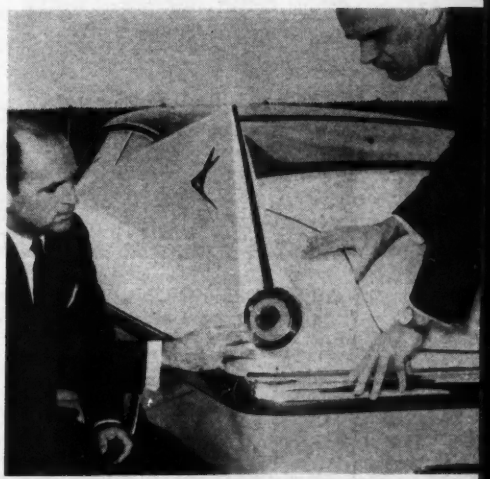


NEW SIX-PASSENGER PICK-UP will be introduced soon. The manufacturer is International Harvester Co. and the car is based on their station-wagon-type *Travelall.* Called the *Travelette,* this pick-up will be the sort of rig that many farmers and ranchers might find excellent as all-purpose vehicles able to haul loads and carry the family at the same time. Cab has two full-width seats.



EXPERIMENTAL "DART" receives new attention from top Chrysler stylists Virgil Exner (right) and Bill Schmidt.

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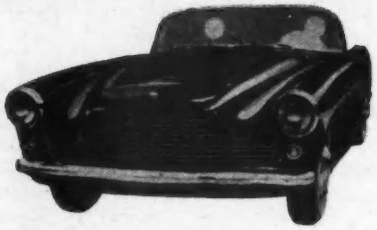

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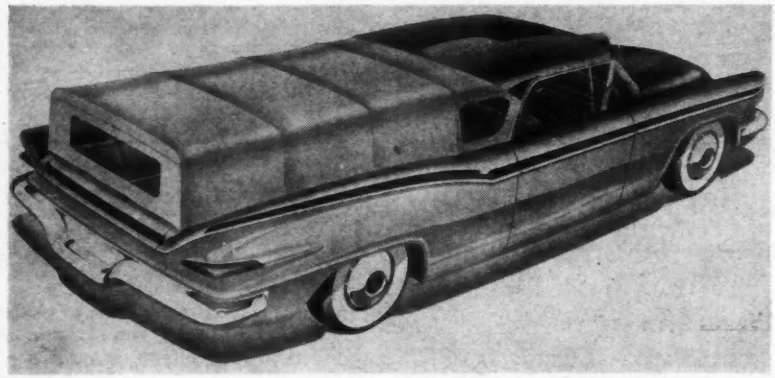
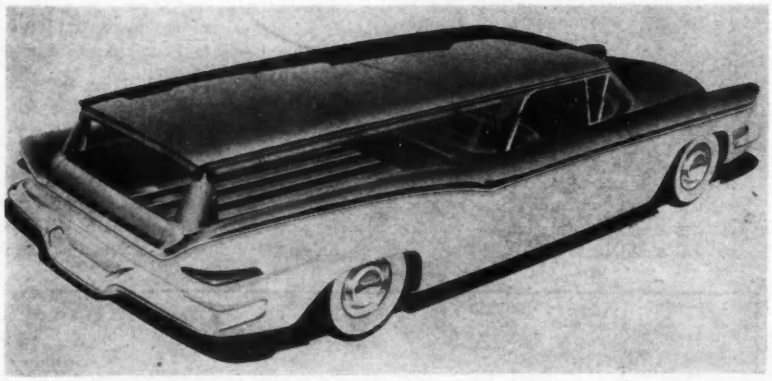
tain more fuel economy and better performance from a given size engine by reducing the force necessary to penetrate the air; and to reduce driver fatigue, thereby increasing safety, by controlling wind wander and improving stability by more functional design."

AERODYNAMICALLY STYLED pick-ups may be just around the corner. Ford officials claim that the '57 Ranchero has sold somewhere around 20,000 units without really trying to set any kind of a record. So, since advanced styling photos are always interesting and because some we just obtained from one of the smaller outfits are equally practical (though unfortunately *not* in the works), we thought you'd like to see these from the Studebaker styling studios in South Bend, Ind.

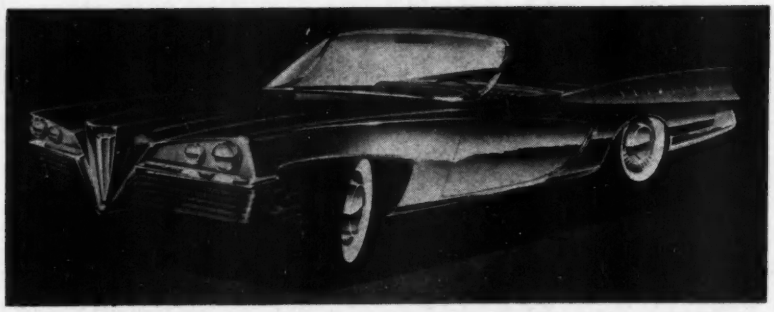
continued on page 16

SPOTLIGHT ON DETROIT

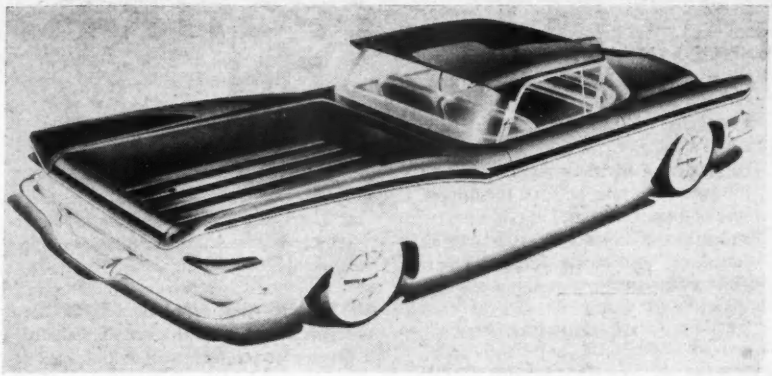


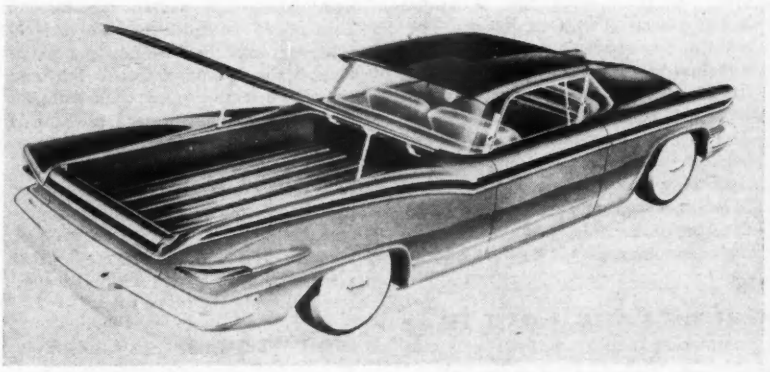


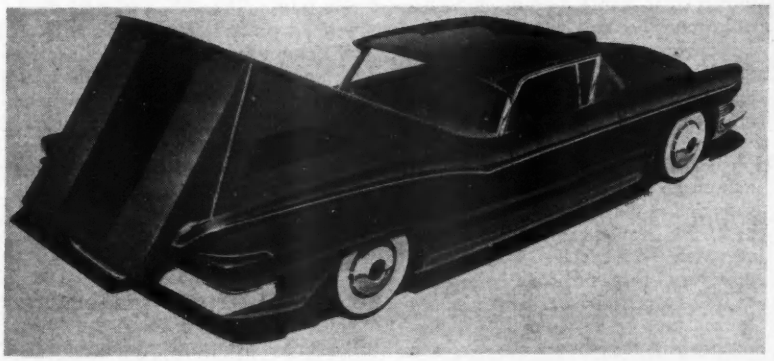
STUDEBAKER'S DREAM PICKUPS feature "covered wagon" top, canvas curtains.



BOULEVARD SPORT CAR with convertible hardtop, could be one of three basic chassis-sharing body concepts, maintains industrial designer Brooks Stevens.







PICKUP BED COVER can be used to support wedge-shaped tent for camping.

STATION SEDAN (above) plus a town or formal car would round out future selection of body styles, predicts Stevens. Cars would be aluminized black.

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MADE TO MATCH MODERN ENGINE PERFORMANCE!

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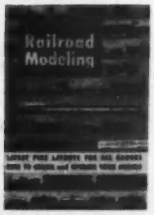

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continued

WHEN IS A PICK-UP not a pick-up? Studebaker stylists logically assume that a pick-up should be low, sleek, attractive. (Ford has proved this.) They believe that a cover over the bed not only makes perishable loads more secure, but that the cover can also be used to support a sort of modified tent for camping trips and such outdoor activity. Carrying this functional philosophy further, Duncan McRae's stylists have designed a modern "Conestoga" wagon top for the swank truck's bed—the utility is obvious.

THE REAL DUAL-PURPOSE HONEY is an open-sided full-length roof of steel made integrally with the cab roof. Rolled canvas curtains, sides and rear rapidly convert this pick-up of the future into a real family conveyance for those who want the ultimate in a car capable of serving the several personalities of one vigorous master. Here are five top-notch ideas for functionalism combining good design, a wide range of facilities, and sufficient style to appeal to those, in the wide open spaces, needing maximum utility in a single vehicle.

WHEN THE BUYER'S MARKET hit the automobile industry several years ago after the *seller* had been in the saddle) it became evident that the pathway to success lay in giving the majority of the customers what they wanted. Not only are the manufacturers conducting research on styling and engineering, but they have also turned their attention toward keeping their buyers happy.

IN A NUTSHELL, this was the principal nub of the thesis presented to a recent gathering of the automotive press corps by M. M. Dean, Quality Control Manager of the Ford Division. When the net proceeds to be gained from horsepower and racing performances were trimmed to the cuticle by the recent A.M.A. pronouncement, the industry was certain to latch onto other features which could be promoted in the ever hotter sales battle of the giants. *Economy* was rumored to be the next big pitch—it's getting some attention, but economy smacks a bit of "lowering one's standard of living," in the words of FoMoCo's Ernest R. Breech. *Creature comforts,* as sales bait, have been with us for several years. *Safety* was tried in 1956 with varying degrees of success, mostly disappointing. For '58 the stage seems set for a two-pronged approach: comfort, spearheaded by air suspension, and quality. Ford has their version of the former but now appears to have gotten the jump on competitors with a well developed and seemingly successful method of achieving a high degree of *uniform quality control.* This system should enable management

SPOTLIGHT ON DETROIT

to pinpoint those who goof on the assembly line and either forget or neglect to do their job well.

CUSTOMER AND DEALER GRIPES have, formerly, been the industry's main barometer of product satisfaction. Such reports filter back to GHQ—Dearborn in this case—too slowly. In Mr. Dean's own words, "the damage has already been done." So considerable high level study was expended to develop a means to rate the output of Ford's far-flung chain of assembly plants. The micrometer job on component parts had already been done—overall quality of the *completed* car was the target. The often too-hasty inspections given the cars as they rolled from the end of the lines at several thousands per day did not go deep enough—this thing had to get down to a nuts-and-bolts system with all inspectors following the set of rules.

A POINT SYSTEM was finally devised giving definite numerical value to defects. *Audit teams* were organized and trained. Salaried employees, these team members were *not* production personnel. A Quality Control Manager was appointed for each separate assembly plant—the quality audit teams report, directly to him, their findings. The teams select, at random, cars that are supposedly ready for delivery to the dealer. (The latter worthy has been taking a lot on the chin in recent years; he has been blamed too frequently for defects that are assembly line matters.)

EACH CAR SELECTED FOR QUALITY audit is subjected to visual and operational inspection of "1500 different items." According to Quality Chief Dean, "a complete car audit requires almost three man-hours of intensive scrutiny." The teams select any car they choose—"a statistically valid sample" in Dean's words—enabling the quality audit teams to "evaluate overall production at each plant daily." This is Ford's counterpart to the remarkably accurate public opinion polls.

SPECIAL FORMS with literally hundreds of blank spaces are executed by the audit teams. The categories covered sound like a lot of fluff. We have, however, seen these forms, talked with several officials, and been privileged to personally examine some of the rejected cars. Properly employed, this system can provide you with a better car.

THE BODY VISUAL Audit Record form covers all exterior and interior parts as to the fit of components—the various sheet metal panels—the finish, the soldered joints, the paint, the operation of doors, windows, hood and rear deck lid, the security of weather-stripping. In general this inspection phase covers those features which a sharp-eyed customer might notice in the salesroom. A tail light bezel, for example, might be only slightly misaligned. Since this defect is easily corrected, the demerit marked down is 0.2 point—though out of standard, this is considered incidental. A scratch on a painted surface, inside or out, however, is considered to affect negatively the car's quality; since refinishing rather than a simple readjustment is required in such a case, two points are marked down in the appropriate place on the Car Body Audit Sheet.

MAJOR IMPERFECTIONS, those that cannot be readily corrected by readjustment or by refinishing, are rated a whopping 10 points. An example would be a hood that refuses to close evenly even after readjustment of the hinges, or a door which is sprung. Any item that requires that the car concerned be rerouted back through the refitting shop, no matter the reason, is of poorer quality with a single *major* 10-point defect than a car with two or three *minor* 2-point and *incidental* 0.2-point faults.

THIS SYSTEM'S MERIT is in the exactness required of *each member* of each quality audit team. Each assembly plant's audit team will be grading a cross-section of the local output precisely the *same way* as will a similar team 2000 miles away in another plant.

WATER TEST RECORDS cover 33 points of possible leakage. No simple splash test, this one; the car gets a thorough dousing in special test booths devised for this purpose. Next comes the "Chassis Visual Audit Record" in which the operation of all accessories, the driving controls, the correct alignment of the several linkages and belt drives are checked. The routing of the wiring and brake lines, the complete installation of such parts as the cotter pin through the wheel spindle, the retaining ring in the universal joints, the presence of transmission and crankcase drain plugs—all these are checked. Literally hundreds of easily forgotten small parts come in for a visual recording—that brake fluid line for instance, or the element in the lighter.

FRAME WELDS, the security of the steering linkage, tightness of the fuel tank hangers, and the presence of innumerable items—any one of which can spell trouble if omitted—are spot checked to a greater extent than ever before. After this time-consuming examination comes the "Driving and Measurement Audit Record" requiring an actual operation road test over a prescribed course that includes several types of road. Automatic transmissions that fail to shift up at the right point are caught; the overdrive unit that fails to kick-down properly, the clicking U-joint, the too-loose tappet that would cause a customer to return to his dealer in a huff because of the noise, or the defective differential that whines unnecessarily (probably a 10-pointer) can, alone or in combination with other defects, cause the car to be rejected for delivery.

THE MEASUREMENT part of this test is probably the most involved of all and requires the quality auditor to actually *torque check* all the many critical attachments. Going beyond the roll call of nuts and bolts, this particular phase of the three-man-hour inspection specifically requires the auditor to certify that the head bolts, for example, are torqued within the prescribed limits set forth in assembly specifications. Frame and body bolts get a torque test too.

HOW MANY TIMES have you heard a friend say that he had to return to have the front wheel alignment corrected—sometimes after he'd scrubbed half the rubber away from a new tire on a new car? Caster, camber and toe-in are checked and, according to Dean, must be correct before that car is delivered—the dealer is no longer expected to have to correct sloppy assembly methods.

NOW THIS IS NOT TO SAY that the day of the perfect car has arrived. Not so. But the point is that this new Quality Audit system is currently proving worthwhile. The auditing teams are checked too; at times teams go forth from Dearborn to determine whether the plant teams are functioning as they should be. Nor does the fact that a watchdog team is operating in every widely dispersed plant mean that the sloppy workman will be immediately eliminated.

PRIDE OF WORKMANSHIP is, according to Dean, "encouraged" by the individual workman knowing that *his* particular job is observed and checked from time to time. When the various forms are completed by the audit team, they go to the plant manager who "then can trace the defect right down the line to the person charged with installing the cotter key," and by the same token a consistently good record is also more easily checked. We believe that Ford has something—the system seems basic, but so is good workmanship; it's more important than bhp! /MT

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"Chrysler will offer, optionally, air suspension on all five makes early in '58."
FALSE—Nothing to this one, at least at presstime. Possible reason for this rumor is that American Motors has announced air suspension to be available, in the *rear only*—and because Chrysler's front torsion bar system precludes air's easy adoption there but leaves the rear suspension open to change plus adoption of levelizing. We've seen some Chrysler Corp. cars sagging, in the tail, from overloading in trunk, etc., but we do not look for this development.

"Lincoln is embarrassed with its current rating of merely 375 horsepower in the light of li'l brother Mercury's 400."
TOO TRUE—And Lincoln-Mercury Division's general manager says Lincoln, too, will have 400 horses. They'll do it with a triple dual-throat carburetor setup!

"A flip-top, hardtop convertible similar to the Ford Division's rig will be introduced by Lincoln before long."
FALSE—At least not in the '58 model year, as was indicated by earlier information. We will, however, predict this development for 1959.

"The Goggomobil that Studebaker-Packard is said to be getting ready to market will be a slightly larger version of the midget we featured in August '57 issue."
FALSE—Fact is, while we knew about this Goggomobil *variant* last July, we have intentionally stayed away from this popular argument because we are inclined to believe that little, if anything, will ever come of it. Incidentally the Goggomobil in question is, repeat *is*, a cute little two-seater cloth-top convertible and the prototype happens to be painted one of the primary colors—the darkest primary color to be exact.

"Saab of Sweden is jumping production to meet demand."
TRUE—And the demand, unprecedented, is in the USA. Latest word from a factory spokesman is that production is now proceeding at the rate of 12,000 cars per year, and that this will soon be doubled. This is remarkable when you consider that just one year ago the production rate was a rather inconsequential 4000 per year. Saab's recent success at Lime Rock, Conn. in the "Little Le Mans" race for small imported sedans will do much to put this excellent car over with the bang it deserves.

"Ford's new Thunderbird will be available in a convertible version as well as the already known hardtop."
WE DARE NOT SAY—Coy is the word for the Ford Division on this score at this time but it's our guess, a studied one at this writing, that there will be a drophead ragtop—however, we wouldn't advise readers to lay any money on the wager line on this one.

"Combining Mercury and Lincoln into one division means that all of FoMoCo's cars will feature unitized body/frame construction by 1959."
FALSE—Not by 1959; this would require a staggering outlay of cash to almost completely rebuild virtually all of Ford's assembly plants. Not only would the financing required tax even this very solvent giant, but it is extremely doubtful whether the rebuilding and almost complete retooling could be accomplished in time for 1959. A better estimate would be 1961 at the earliest, and even that is doubtful. Building *unitized* cars in the one or two hundreds of thousands is far different from a million-plus number.

"Chrysler Corp. will be marketing a foreign-built car by February 1958."
FALSE—According to a spokesman, who must remain nameless, Chrysler is, though, "continuing intensive studies started in December, 1956 of small cars with particular emphasis upon the *world* market and is awaiting the outcome of these detailed studies before making any decisions." And that is straight from the horse's mouth as this is being written; "Nothing is imminent."

"One German import will most likely be withdrawn from the American market very soon."
TRUE—The name of the car is Lloyd; seems that it lacks two things: competitive quality and vigorous marketing—it's not even pushed in its importer's home area.

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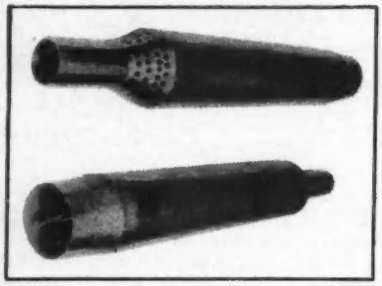
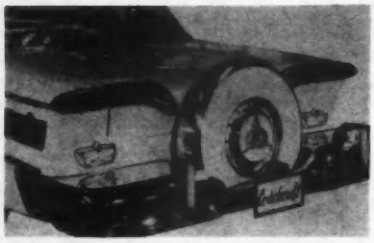
TRENDS in New Products

SOMETHING NEW in muffler design is offered in a unit called the Jones Venturi Exhaust Modifier. The design utilizes a venturi principle with conical baffles which mixes exhaust gases with fresh air within the modi-



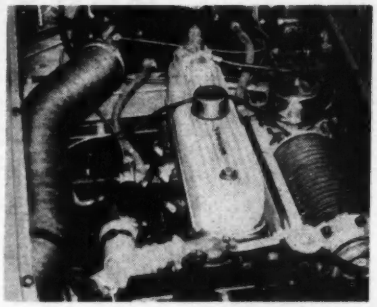
fier. It is claimed the unit will greatly reduce back pressure. The modifier is constructed throughout of stainless steel and is Heliarc welded. It is installed at the extremity of the tailpipe and the exposed shell is highly polished. The A-1 Drag model (loud note) is $25 and the A-3 Sports and Modified (quieter note) model is $35. The unit is manufactured by J. B. Engineering, Inc., 7337 Valaho Drive, Tujunga, Calif.

EDSEL OWNERS who want to add that Continental look or gain more trunk space can now do so with a spare wheel assembly by Coachcraft. These assemblies for all series in the Edsel line range in price from $135 to



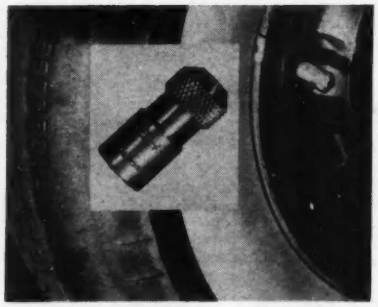
$192.50 plus installation. The model shown in the photo is the Super Deluxe with an open face plate. It has polished stainless steel stone deflectors as well as a stainless steel tire ring. Other models are available with painted stone deflectors, painted tire ring and a choice of open or solid face plate. For additional information you may contact Coachcraft Sales Corp., 9015-17 Santa Monica Blvd., Los Angeles 46, or your nearest Edsel dealer.

MG-A OWNERS looking for more scat in their cars can now equip them with a Judson supercharger that can be easily and quickly installed using standard tools. The unit is a rotary vane type which is driven at less than engine speed. All necessary brackets, a



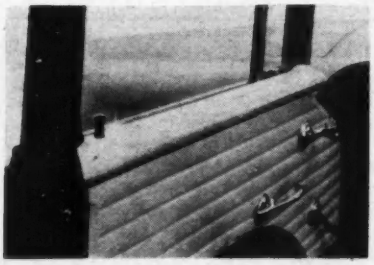
special carburetor, air cleaner and an aluminum valve cover which incorporates the supercharger lubrication system are furnished in the kit. No chassis or body modifications of any kind are required. Literature is available upon request from Judson Research & Mfg. Co., Conshohocken, Pa.

CHECKING TIRE PRESSURES at a glance is possible with the pressure-indicating valve cap called Tell-a-Cap. These caps are pre-set to indicate a drop of three pounds or more from a specified pressure. A red-colored rod in the center of the cap stays up when the pressure is normal but drops back into the body of the cap when the pressure is low. Passenger



car tire ranges are from 22 to 36 pounds in two-pound increments. Tell-a-Caps are available from Practical Products Mfg., Inc., 6566 W. 88th Pl., Los Angeles 45. The price is $3.95 per set of five.

PROTECTING THE MOTORIST against burnt elbows and covering the worn, scratched, window ledge surface has been accomplished by the introduction of Sillgard, the new window sill trim made of DuPont Mylar. The material is soft and yet has great

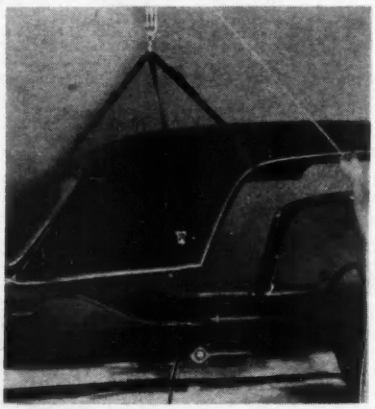


wearing power and durability. It is resistant to oil, water and grease. No tools are needed for installation as it is only necessary to strip off the backing paper and apply the Sillgard to the surface. It is available in two sizes that fit all cars, with a choice of chrome or gold finish. Manufacturer is the Sutone Corp., 3001 E. 12th St., Los Angeles 23. Price for two pairs of the 21-inch size is approximately $1.60 in chrome and $1.80 in gold. The approximate price of one pair of the 36-inchers is $2.16 in chrome and $2.48 in gold.

SEEING RED is a new means of detecting those hard-to-locate oil leaks in crankcases and automatic transmissions. This oil-base lubricating oil dye is added directly to the engine oil causing it to change color so that

leaks are easily seen even if the crankcase and transmission are coated with grime. The manufacturer claims the product is completely safe as it has no harmful chemical effects when combined with petroleum products. The price is $1 postpaid, and the product can be obtained from Ream & Blovett Co., 4259 Beverly Blvd., Los Angeles 4.

WRESTLING a removable hard top on and off your car can be quite a chore. The use of an Auto Top Lift can make this job easy and



it also stores the top overhead in the garage or carport out of the way and safe from damage. It can be obtained for $9.95 postpaid from James Auto Specialties, Box 151, Pasadena, Calif.

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First Feel Behind the Wheel

PACKARD

DRIVING THE '58 PACKARD is surprisingly pleasant. The front suspension has undergone slight but important changes: the shock absorbers have been improved, and there is a new anti-sway bar in the front. The rear semi-elliptic leaf springs are asymmetrical so as to handle increased loads with less deflection. A new one-piece driveshaft enabled the engineers to lower the tunnel, which formerly was quite high, especially in the front seat.

Overall height is about two inches less than in '57. The wheels are now 14-inchers. Basically the Packard is a Studebaker, let's face it. However, S-P finds justification for using the same basic body shell as the Studebaker—this is the modern manner to save tooling and production costs.

Chief stylist Duncan McRae has accomplished much, and in little time too. Dual headlights, standard on all models, form the basis for rather extensive restyling that has been done with remarkably little in the way of new dies.

A facelift? Yes, but more than was to be expected. The four-door sedan and the station wagon appear less changed, although they share the new grille which is synonymous with that of the Packard *Hawk* (Nov. MT).The low and sloping hood is Fiberglas, as is the grille frame and the front body extensions which make the grille possible. The dual headlights result from a widening of the front fenders with separate metal. The hood air-scoop is non-functional.

by Joe H. Wherry
Detroit Editor

Most attractive in the line is the thin-roofed two-door hardtop sedan. The prototype was stiff and hand-built, but we were able to step it up for a few moments. Driving with the automatic transmission in DRIVE-1, we clocked zero to 30 mph in 3.9 seconds; to 45, 7.2; to 60, 11.9; from 50 to 80, 12.8. The ride was good (there will be no air suspension for S-P in '58), cornering was much improved over past years, and the seating was comfortable. Rear legroom in the two-door hardtop is competitive with the industry, perhaps better than some of the higher priced prestige models.

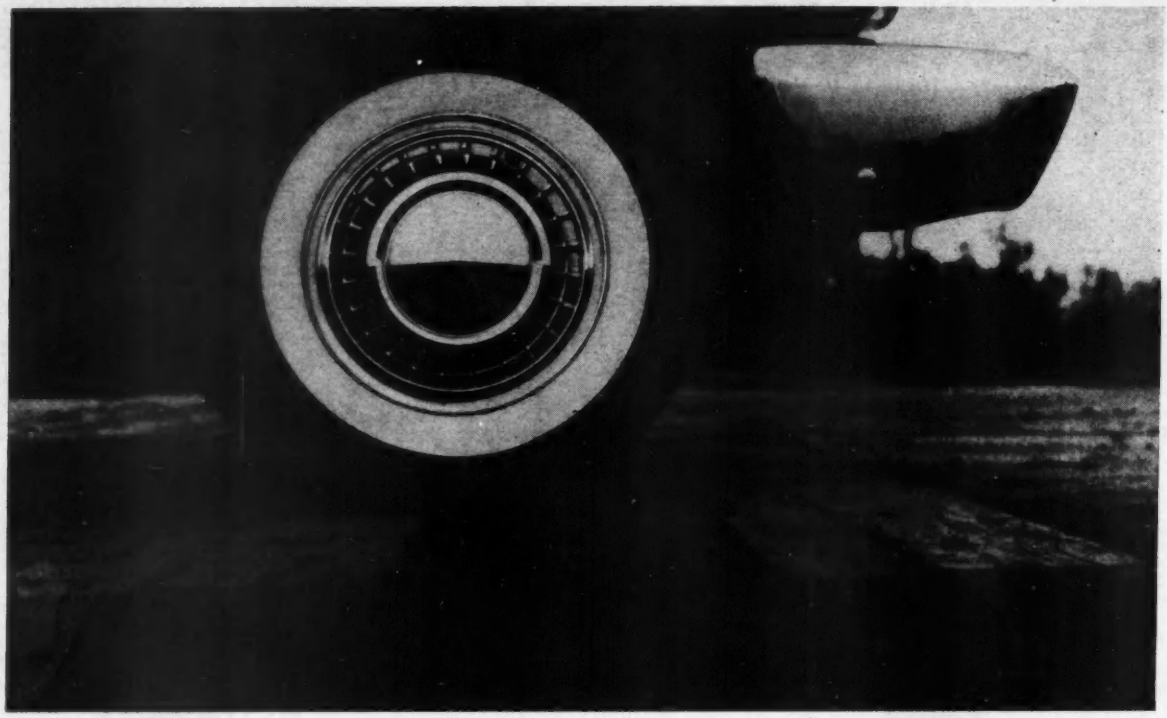
Prestige? No, S-P brass candidly admit that the current Packard is not of that class. "We offer distinction and quality craftsmanship," they will tell you.

All of the usual options from air conditioning to powered windows are available. The engine, 289 cubic inches of reliable ohv-V8 design, is shared with the Studebaker President series, thrives well on regular grade fuel, will be above average in fuel economy. There will be no supercharger on the Packard passenger cars—that's left to the Hawk. /MT

PACKARD station wagon has air of distinction, if not prestige.

Behind this magnificent new front lies the greatest sports car performance per dollar in the world... don't let it pass you by.

Standard-Triumph Motor Co., Inc., Dept. D1, 1745 Broadway (at 56th St.), New York 22, N.Y.



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Torsion-Aire is Chrysler Corporation's name for its rubber-isolated, ball-joint, anti-dip, torsion bar system of suspension. And it's unique among American cars. Its design comes from a fresh start, a clean drawing board. It is based on the belief that piecemeal modifications—and design compromises to accommodate optional suspension elements—are no match for a fully integrated, balanced system designed as a *whole*, with the *whole* car in mind.

As a result, it's *the most advanced suspension system yet developed*. No other gives you *all* these important advantages:

• Torsion-Aire is built right into the car. It's not "added on" or "extra". The Torsion-Aire system was designed for the car . . . the car was designed for it.

• Torsion-Aire is a complete system. It is designed "in depth" to eliminate your three biggest handling problems. No more starting squat. No more sway on turns. No more braking nose-dive.

• Torsion-Aire is standard equipment on *all Chrysler Corporation cars*—and at no extra cost. Suspension isn't an accessory you can take or do without. It's as basic to the car as wheels.

• Torsion-Aire is a proven system. Unlike untried systems, Torsion-Aire has been proved by billions of passenger car miles—by more than a million satisfied owners.

Want more proof of Torsion-Aire superiority? Take the Torsion-Aire road test. You don't have to seek out special conditions. With a bump in almost any block—and a corner at the end of it—you can prove this new kind of ride to yourself in the first quarter mile!

CHRYSLER CORPORATION — THE *FORWARD* LOOK

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1958 SHOW ISSUE

IN THIS COUNTRY you can buy a new car in almost any price range you choose—from a small, economy model to the plush $13,500 plus Cadillac Eldorado Brougham. It depends on what you're looking for: a car to get you from your house to work or the grocery store by the most economical method, or a car to take you to the country club in the most fashionable style.

Between these two extremes are almost a score of American makes, each of which has something to offer for '58. These cars, and their individual claims to fame, are reviewed on pages 28-33.

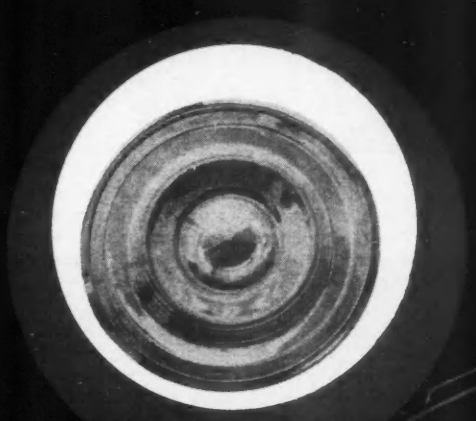
After you've read about the new features of the '58s, you'll see that certain definite trends are evolving. What they are, and what effect they may have on you and your future car, can best be explained by a more analytical discussion of our cars today in terms of trends in bodies (page 34), trends in engines (page 40), and trends in suspension systems (page 46).

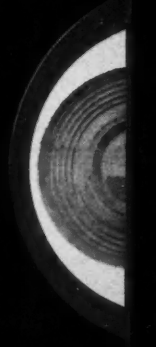
To get an even greater insight into the '58 cars, we've taken the best-selling and most popular car from each of the Big Three and performed exhaustive road tests on them. Now we can tell you how they perform, what's good about them, and what's bad about them (page 52).

There are, of course, still a few big unanswered questions in the minds of many potential buyers of '58 cars: Are the manufacturers building the new ones any better than previously? Are they paying more attention to quality control? Are they listening to service complaints from their dealers and customers? The answers to these questions can be found on page 64.

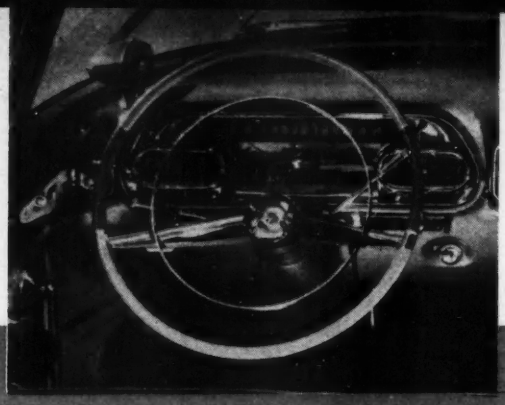
And what about safety? The alarming number of traffic fatalities and injuries on our highways should be incentive in itself for a vigorous campaign for safer cars and safer roads. What are the manufacturers doing about it? You'll find the answers on page 66.

Naturally, in this—our second annual Show Issue—we can only hope that we've anticipated the majority of your questions about the new cars. In future issues we will devote more space to answering your specific questions on individual cars—told through road tests, surveys, and technical articles. In the meantime it is our sincere belief that this issue will serve as a valuable reference. We'll be interested in knowing if you agree.—**The Editors**





first feel behind the wheel



CADILLAC

by Joe Wherry
Detroit Editor

WHEN YOU HAVE a good thing," the Cadillac people are prone to say, "why change?"

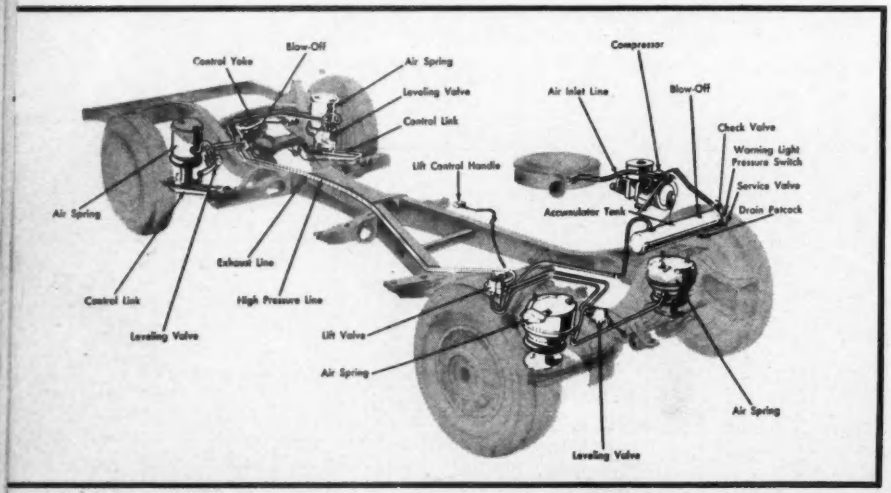
They have a point and Cadillac's firm hold on the prestige market may prove the point. Of course several changes are evident, but they are definitely in the face-lift category. Take our introduction model for instance, a luxurious Series 62 Coupe de Ville; it's scarcely an inch longer than the '57 counterpart. The wheelbase is unchanged, and the overall width is the same. The height overall, too, is unchanged.

Under the hood there are few changes. The compression ratio has been stepped up, slightly, to 10.25 to 1 on all models. Advertised horsepower, therefore, now stands at 310 bhp at 4800 rpm with a single four-barrel carburetor. This engine is standard on all models except the ultra-luxury jobs—the Eldorado Biarritz and Seville and the Brougham. The latter have the otherwise optional "Q" engine which shares the same block but has triple-two-barrel carburetors with ratings of 335 bhp at 4800. Regardless of carburetion, the torque of each is stated at 405 pounds-feet at 3100 and 3400 rpm respectively.

Dual range Hydra-Matic transmissions are standard on all, of course, as are power steering and power brakes. Steering has been improved, unspecified details having enabled even more effortless steering, and response is quick with only 3⅔ turns of the wheel being required from lock-to-lock. The wheel size and effective brake lining area are the same as last year.

Cadillac's new tubular center section X-type frame, introduced in '57, is little changed except for modification necessary to accommodate air suspension, an option on all models except for the Eldorado Brougham where *air* is standard. A new four-link-type trailing arm rear suspension is used across the board. Our steel-sprung *first feel* car was equipped thusly. A trailing arm attaches, on each side, to a crossmember extending far outboard of the wasp-waisted frame forward of the rear wheels. These two arms precisely position the rear axle. Another trailing link, actually two links in one and shaped in outline like an asymmetrical circle, attaches to the differential cage, in the rear, and is hinged to the rear frame crossmember.

Take a new Cadillac, one with coil springs, through a fast series of S-bends and you'll gain new respect for the roadability that *can* be built into a large and heavy car. Solidly positioning the rear axle in this manner prevents torque and road-induced misalignment of the rear axle. The big car holds firm at speeds at least 50 per cent greater than could formerly be held. On fast corners there is still considerable heeling over, but no longer is this accompanied by as much rear end sway as formerly. Rear end breakaway is less likely, there's more warning, and correction is easier and less violent.



FRAME has only slight modifications to accommodate air suspension system.

STARTING OUT from scratch, with the Hydra-Matic selector in top DRIVE range, our 310-horsepower Coupe de Ville made the following acceleration times: 0 to 30 mph, 3.9 seconds; to 45, 7.4; to 60, 11.7. The 50-80 time was 11.8 seconds.

A cold rain hampered these acceleration tests; despite this, however, rear wheels did *not* hop; they stayed put under maximum torque, slipped remarkably

little, and evidenced the benefits of the trailing links in the rear with better traction and less squat.

On a high-speed test track this heavy car snuggled down in the curves and, though the road was wet, it was solid and unaffected by a moderate crosswind that blew all day. It gave excellent feel of the road. The optional air suspension would, theoretically at least, give a softer ride. How this could be, or better yet how the air bags could improve ride and driver feel and control proportionately, is difficult to imagine since the new rear suspension now allows a more violent type of driving with increased road adhesion.

But Cadillac buyers are not usually so concerned with handling approaching that expected of sports cars as they are of the quality evidenced and the appointments. There are no less than 55 interior trim and color combinations available on all series below the Brougham; the latter has 44 available interior trims. The power window controls have been extended, in scope, to include the front vent windows. All four-door models now feature rear vent windows as well. Stylish and just as practical is a new molded Fiberglas headliner for the hardtop models. Easy to clean, this headliner has sound-deadening properties as well. The buyer can choose conventional two-way power seat controls or six-way controls; the latter are now controlled from the driver's armrest. Also optional is power operation for the rear deck lid—a switch in the glove compartment does the trick. Electrical door locks are also optional on any model with power windows.

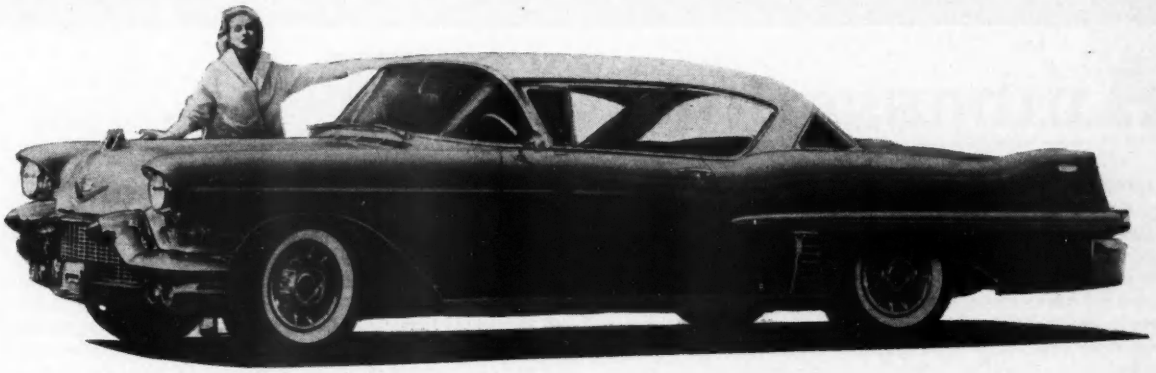
Passenger comfort in the front seat has been improved by relocation of the radio speaker in the dashboard—it was in the center of the floor. The instrument panel now includes, at the right side, the clock. Vacationers will find that their '58 Cadillac, regardless of model, will hold more luggage than formerly. The trunk has a new floor that is perfectly flat.

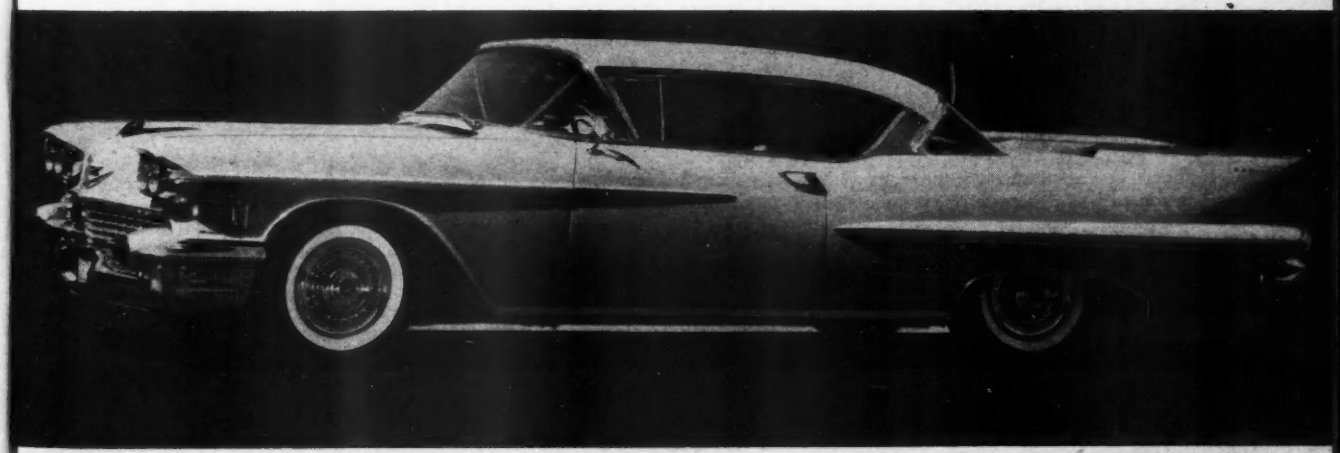
OUR TEST CAR was a run-of-the-mill job and so we noted, particularly, that assembly and workmanship generally were excellent. In '57 we experienced drafts, in one hardtop, caused by badly out-of-line doors and weatherstripping. We have been told that Cadillac is tightening up on quality control. Even fine car manufacturers have to watch final assembly; the new models should show improvement to the point where they will undoubtedly be the best assembled high-priced cars made domestically.

Cadillac has not released the percentage of air-suspended cars they expect to build, but the ratio will probably be the highest in the industry. This system is refined over that introduced on the Brougham last spring but is technically the same. Incorporated in the air suspension system is a lift valve actuated by an under-dash handle which forces the air bags full of air, puts the car at full-jounce position to enable the driver to clear obstructions, high road centers in an emergency, or to back out of steep driveways without damaging bumper guards, etc.

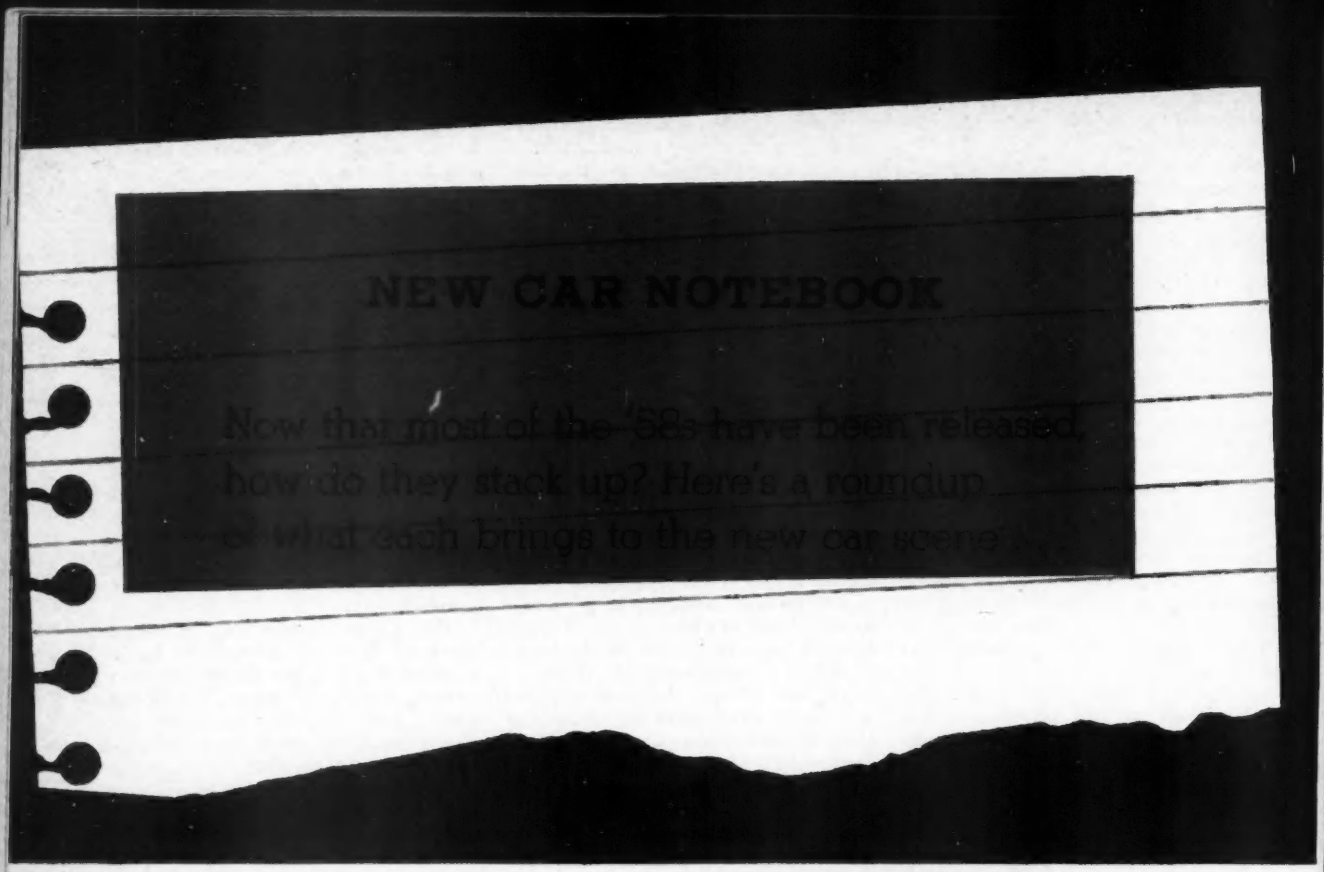
Distinctive styling in the Biarritz and Seville models in the Eldorado series is maintained by rear quarter panel trim, by a different bumper bar, and by vertical strips between the outer bumper sections. The Biarritz features Cape Buffalo leathers with both grained and metallic finishes, or one may optionally choose combinations of leather and metallic-threaded nylon materials.

The 133-inch wheelbase Fleetwood Series 60 Special is distinguished by an extruded aluminum panel across the lower portion of the rear quarter panel—this grooved decoration is matched on the rear deck between the backup lights. Stainless steel gets a new nod from Caddy on the Fleetwood 60 with a rocker sill molding beneath the doors. /MT





BODY STYLING for '58 (below) is not greatly changed from '57 (above) except in front end.


NEW CAR NOTEBOOK
Now that most of the '58s have been released,
how do they stack up? Here's a roundup
of what each brings to the new car scene

Ambassador

AMERICAN MOTORS' "senior car" in the Rambler series, its Ambassador V8, replaces Nash and Hudson names. Body is basic Rambler, with nine inches added between rear of front fender opening and front door, giving it 117-inch wheelbase as compared to Rambler's 108. Line includes a super and custom four-door sedan, four-door station wagon, custom four-door hardtop sedan, and four-door hardtop station wagon. Appearance-wise, Ambassador is similar to Rambler, only longer and with more distinctive styling including smaller-opening egg-crate design grille, upswept flared side trim. On custom models, this thin spear is silver anodized aluminum panel; on supers, panels are painted. Engine is bigger-bore version of AM's V8 used in Rambler Rebel. Increasing bore from 3½ to four inches ups displacement from 250 to 327 cubic inches. With compression rates increased from 8.7:1 to 9.7:1, power output is respectable 270 bhp (55 more than Rambler). Like Rambler, Ambassador has standard transmission, with overdrive and Borg-Warner's pushbutton-controlled Flash-O-Matic offered as options. New Powr-Lok limited-slip differential is also optional. New step-on parking brake with T-shaped release lever is used. Pushbutton radio is transistor-powered, has twin radio speakers on both ends of instrument panel. Torsion sway-stabilizer bar on front is only significant chassis difference between Ambassador and Rambler. Optional is a new variable-speed engine fan; it decreases fan's revolutions per minute in relation to car's speed, thus reduces noise and power losses, increases fuel economy.

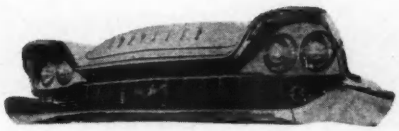
Buick

Traditional styling features of previous Buicks have been scrapped for their '58 models, in a bold attempt to regain third spot in the popularity poll. Major styling changes, a new transmission, air suspension (optional), and a fifth series named the Limited are expected to improve Buick sales for '58. Special and Century models will use 122-inch wheelbase, while Roadmasters, Supers, and Limiteds will share 127.5-inch frame. Limiteds, however, are full eight inches longer than Roadmasters—all in overhang behind rear seat. Only minor changes have been made under hood on various engine designations, with same 364-cubic-inch engine used by Buick in '57 continued in all models. Two-barrel carburetor is on Special, four-barrel on all others. Compression ratios remain same as in '57, as do power ratings—9.5 to 1 and 250 bhp on Special, 10 to 1 and 300 bhp on rest of the line. New Flight Pitch Dynaflow, in which stator vanes operate on same "switch the pitch" principle as an airplane propeller, is credited with increasing torque output in low-speed range and when needed. Replacing low range position on Dynaflow quadrant is a grade, or hill, retarder (G), to give greater transmission braking on hills, reducing wear on brakes. Buick's variable-pitch Dynaflow used in '57 is continued, standard on Super and Century series, optional for Specials. Flight Pitch is standard on Roadmaster and Limited models. New air suspension system is optional.

Chevrolet

Chevrolet is all-new for '58, except for retention of last year's 283-cubic-inch V8 engine for certain models; but in addition a brand-new 348-cubic-inch V8 is optional on all models except Corvettes. The familiar overhead-valve six with 145 hp is again offered. From ground up, car is new; it has an X-shaped frame without conventional side rails, a different suspension system using coil springs at all four wheels, optional air suspension, and completely new styling which incorporates longer (nine inches) and wider (3.7 inches) bodies of conservative yet highly appealing appearance. Two new and higher priced models now are in Bel Air series; they are Impala sport coupe and convertible. Biscayne series is comparable to '57's Two-Ten series; Delray models replace One-Fifty series. New 348-cubic-inch engine has two horsepower ratings—250 for four-barrel carburetor and 280 for triple two-barrel carburetor version; it also features new wedge-shaped combustion chambers credited with giving greater power at lower engine speeds than engine of former design. New engine is well over-square, having bore of 4.125 inches, stroke of 3.25 inches. Compression ratio is 9.5 to 1. Fuel injection is not available with this engine. Turboglide transmission is continued. Dual exhausts are standard with 348-inch engine. (See Chevrolet road test, page 52.)

Chrysler

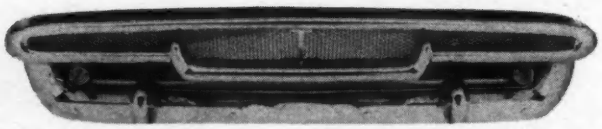


Engineering improvements and styling refinements are the big news in Chrysler cars for '58, rather than drastic changes. Their 16 models in the Windsor, Saratoga, New Yorker, and the 300-D series, offer two basically different engines that range from 290 bhp for the two-barrel Spitfire V8 on the Windsor to the fuel-injection 390 bhp on the 300-D top model of the line. Windsor and Saratoga models are equipped with 354-cubic-inch engine, the former with a single two-barrel carburetor while Saratogas have a four-barrel unit and dual exhaust. New Yorkers and 300-Ds use the big 392-cubic-inch Firepower V8 with compression ratio of 10 to 1. Four-barrel carb, duals are standard on New Yorkers. Twin quads and duals are standard on 300-Ds; Bendix electronic fuel injection optional on latter. To improve economy, higher rear axle gear ratios of 2.93 on all TorqueFlite-equipped models, except 300-D, are standard. New optional Auto-Pilot safety accessory allows selection of any cruising speed by means of dial on instrument panel. When car attains pre-selected speed, a warning back-pressure develops on accelerator pedal. Four-stream windshield washers are standard on New Yorker and Saratogas, optional for Windsors. Rear window defrosters, limited-slip differentials, six-way power seats, remote control outside rear view mirrors, and transistor radios are optional equipment items of interest. Minor facelift is counterbalanced by engineering improvements.

Corvette

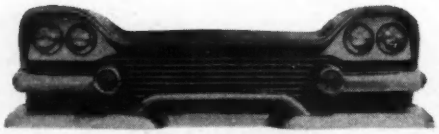
Advertised as "America's only true sports car," the '58 Corvette continues in this tradition, with improvements that make it even more desirable. Styling remains practically intact except for new dual headlights, false louvered hood, beefed-up bumpers. In answer to seemingly justifiable criticism, entire dash, instruments, and controls have been revised and relocated for better readability and operation. Engine is same 283-cubic-inch powerplant that gave competition a bad time last year. Single four-barrel carburetor, 9.5 to 1 compression ratio are standard. Hot camshaft, fuel injection, or duet of four-throat carbs, and 10.5 to 1 compression ratio are optional. Three-speed synchromesh stick shift is standard, or closely-stepped four-speed box is optional. Also available is Powerglide; overdrive is *not* offered. Power windows are optional; you can choose between manual soft top or quick-change hardtop; power-operated soft top is available. Transistorized radio, heater, windshield washer, heavy-duty-brakes-and-suspension package, special wheels are additional extra-cost items. Positraction rear axle, introduced last year, still is offered. Body is reinforced plastic, with additional structural members used for increased strength. continued

DeSoto



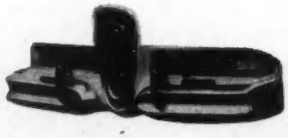
Like all of the other Chrysler Corp. cars, DeSoto is relying on engineering and styling refinements rather than on complete new cars to keep it in a good position competition-wise for '58. DeSoto retains dart-shaped styling with usual facelift changes, including wider appearing grille, cleaner side trim, and 140 different color combinations offered. Wedge-shaped combustion chamber engines replace last year's polyspherical head units for all models. Least expensive Firesweep models use 350-cubic-inch version of new V8, while Firedome, Fireflite, and Adventurer models are equipped with basically same engine bored out to 361 cubic inches. Advantages of new engines are lighter weight and improved accessibility of spark plugs, oil dipstick, oil pump, and filter—all located near front of engine. Firesweep engines have dual-throat carburetor as standard, but power kit consisting of four-barrel carb, dual exhausts is extra-cost option. Two-barrel carbs on engines in Firedome models, with four-barrels used on Fireflites, have single exhaust system; duals optional. Adventurers have twin four-barrels and duals as standard equipment, plus a special high-performance camshaft and valve gear. A Bendix electronic fuel injection system is optional. All DeSoto engines have new "Econo-Choke" carbs, designed to give improved fuel economy.

Dodge



Facelift for '58 Dodge consists of new center-section mesh-type grille, dual headlights, compound-curved windshields for hardtop and convertible models. Again, three lines are offered—Coronet, Royal, Custom Royal—including sedans, hardtops, convertibles. Station wagons include two-door Suburban, and two lines of four-doors—Sierra and Custom Sierra—in either two or three-seat models. Big news is under hood, with new V8 in two sizes offered. The 350-cubic-inch unit is for Custom Royal and station wagon models; 361-cubic-inch is for D-500, also available at extra cost for all Dodge Eights. New engine has wedge-shaped combustion chambers, is offered with single four-barrel or dual four-barrel carburetor setup. On D-500, Bendix "Electrojector" fuel injection system is extra-cost option. Standard V8 for Coronet and Royal models is last year's hemispherical-combustion-chamber engine of 325 cubic inches, with increased compression ratio of 9 to 1. Also available for the Coronet and Custom Coronet is the 230-cubic-inch six-cylinder powerplant, developing 138 bhp, same as last year. Torsion-Aire suspension, introduced last year, is continued without major change and is standard on all models, not optional as is air suspension on some competitive makes. A limited-slip differential, transistor radios, rear window defroster, four-stream window washer, six-way power seats, and air conditioning are optional equipment items.

Edsel



Newly introduced Edsel has 18 models in four series, including two convertibles, sedans, two-door and four-door hardtops, and five station wagons. Two low-priced Edsels (Ranger-Pacer) are built around Ford body shell, chassis, and Thunderbird engine, have 118-inch wheelbase. Corsair and Citation are "kissing cousins" of '58 Mercury, using mostly Mercury chassis components, have 124-inch wheelbase. Dual headlights, self-adjusting brakes which automatically compensate for brake lining wear, and four-barrel carburetor are standard equipment on all Edsels. Also standard, with heater purchase, is single-dial, heater-defroster-ventilator control. New E-400 Edsel 361-cubic-inch engine is used on Ranger and Pacer series and five station wagons; it's rated at 303 hp, has 400 pounds-feet torque. You have choice of standard, overdrive, or automatic transmissions. The E-475 410-cubic-inch engine, for Corsair and Citation series, is rated at 345 hp and 475 pounds-feet torque; only automatic transmission is available. Pushbutton controls for automatic transmission are located in steering wheel hub. Parking brake is step-on type with "T" release handle, similar to Buick's. Ball-joint front suspension with coil springs and semi-elliptic leaf springs at rear are used. Air suspension is now optional. Power assist optional equipment includes usual items.

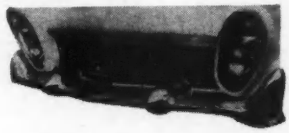
Ford

Extensive facelift changes earmark '58 Fords endeavoring to maintain number one position gained for first time in many years in '57. Twenty-one models on two separate wheelbases (116 and 118 inches) are offered; these include Fairlane and Fairlane 500, Custom, Custom 300, and station wagon series. Two new engines, with fully-machined, wedge-shaped combustion chambers, are introduced for '58. The 332-cubic-inch engine, standard on Fairlane, Fairlane 500, and station wagon series, is extra-cost option on Custom and Custom 300 series. The 352-cubic-incher is extra-cost option on Fairlane, Fairlane 500, and station wagons. Ford continues to offer 292-cubic-inch V8, used for past three years, and short-stroke ohv-six. You can have two- or four-barrel carburetors, or single or dual exhausts, giving various power outputs ranging from 240 on "332" to 300 on "352." Besides regular Fordomatic, Ford now offers dual-range torque converter unit on cars equipped with either *new* engine. Suspension is basically same as '57 except for spring rate change to give softer ride. Air suspension is optional on all Fairlane and station wagon models. Air springs are substituted for coils at front, used with trailing arms and lateral track bar at rear. Full line of power assist equipment is offered. (See Ford road test, page 52.)

Imperial

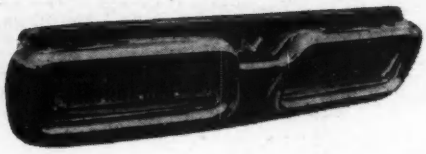
Only minor styling changes are featured in the 1958 Imperial, including a broader-looking and lower grille and side molding revisions. Dual headlights now are standard rather than optional on nine Imperial body styles offered. Engine is same 392-cubic-inch V8 offered in '57 with compression ratio raised to 10 to 1. A new low-profile, four-barrel carburetor, incorporating a three-stage vacuum piston for accurate control of the fuel-air mixture during engine warm-up, is standard equipment. A new feature for '58 is Imperial's Auto-Pilot, another pushbutton automatic driver assist. With this unit the throttle may be operated in a conventional manner, semi-automatic, or automatic. By pre-selection of speed on a dash-mounted control, you can drive on turnpikes and super highways without keeping your foot on accelerator except on rare occasions. Also optional is a limited-slip differential and a heater-air conditioning unit which controls humidity as well as heat. For first time in the industry, a new electric door-locking system is available as optional equipment on Imperials. A single control on dash permits locking or unlocking all car doors; system is integrated with conventional mechanical locking devices whereby a door locked electrically can be unlocked mechanically and vice versa. Sales figures of Imperials indicate public is favorably impressed.

Lincoln



Massive, all-new Lincoln and Continental feature unitized body-frame construction, first in prestige car market. Styling shows influence of Continental Mark II which has been discontinued and in its place a Mark III car, a deluxe and only slightly different version of '58 Lincoln, is offered. Ten models in Lincoln and Continental are available for '58; these include four in Continental Mark III series—two-door and four-door hardtop, four-door sedan, and convertible. All except convertible are offered in Premiere and Capri series. Wheelbases, longest in industry, are up from 126 to 131 inches, with overall length 229 inches. All models use coil springs at all four wheels, making optional air suspension system easy to intall. New 375-horsepower, 430-cubic-inch engine is standard on all three series. Compression ratio is 10.5 to 1 and four-barrel carburetor is standard. Power brakes and 14-inch wheels are now standard equipment. A new cowl-type air conditioning and heating system is optional on all models. Interiors of both cars reflect influence of Continental Mark II, particularly instrument panel's well-arranged grouping and placement of power window controls in armrests, selection of richest fabrics or top-grain cowhide for upholstery, and other luxury appointments. A retractable hardtop convertible is offered in Continental series. continued

Mercury

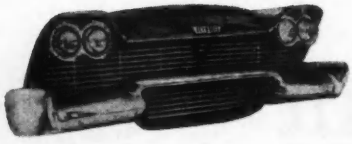


With minor exterior changes and a new top-line series, Park Lane, Mercury blankets medium-price market with 20 models. Park Lanes use 125-inch wheelbase, three inches longer than other Mercurys. All-new engine is available in two sizes. Each has 4.30-inch bore; one has 3.30-inch stroke displacing 383 cubic inches; other has 3.70-inch stroke with displacement of 430 cubic inches. Compression ratio is 10.5 to 1 in all. Horsepower ranges from 312 to 400, depending on engine displacement and carburetor configuration selected. New engines feature water-jacketed intake manifolds and combustion chambers in engine block rather than in cylinder head. Wedge-shaped chambers are fully machined. An automatic brake adjuster eliminates need for manual adjustment of brakes for life of lining, maintains constant brake pedal height. Air suspension is optional on all models; uses trailing arms in rear to hold rear axle in position. Merc-O-Matic is improved with three forward "Multi-Drive" ranges: cruising range for normal driving habits, high-performance range for fast acceleration, and hill control or low range for maximum engine braking on steep grades or for extra pulling power. Hill-holder operates in cruising range, preventing car from slipping back when stopping on grades. Keyboard control now is on dash.

Oldsmobile

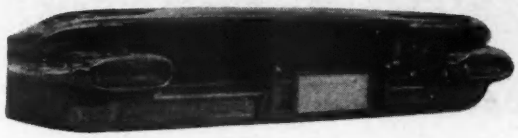
Extensive appearance changes in facelifted '58 Oldsmobiles have resulted in lavish use of chrome trim. Advertised horsepower rating of "Dynamic 88" has been *cut* from 277 to 265, using a two-barrel carburetor instead of last year's four-barrel, in effort to obtain increased fuel economy—the industry's first horsepower reduction. Super 88 and 98 series use same basic 371-cubic-inch engine, but equipped with four-throat carbs, develop 305 hp. J-2 triple dual-barrel carb is optional, boosts rating up to 312 hp. New thermostatic control in Jet-away Hydra-Matic smooths shifts, particularly when starting cold. Three-speed stick shift is still available on Dynamic 88. Optional air suspension uses four compressed air chambers, one at each wheel, is combined with four-link rear axle and manual override valve; latter provides four inches extra road clearance in emergencies. Sixteen body styles in three series are offered. New "Trans-Portable" radio can be removed from dash, as in Pontiac, operates on own tiny batteries. "Safety Sentinel" speedometer warns of exceeding any pre-set speed by flashing and buzzing. Autronic-Eye headlight dimmer now uses transistors instead of vacuum tubes; sensitivity can be adjusted manually. Capacity of air conditioner compressor (optional) is increased by 30 per cent. Strut-mounted instrument panel has latticed steel vanity shelf between windshield and panel. All interior styling matches exterior colors and appointments.

Plymouth



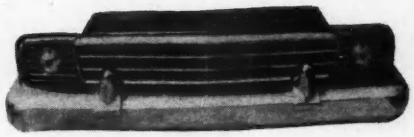
Minor styling changes, keyed to highlight previous year's models, are for Plymouth for '58. These include "Silver Dart" side molding treatment, designed to emphasize upswept rear fender fins, new turn signals and parking lights between twin dual headlights, and lowered grille design. Interior changes include relocation of rear-view mirror at point to left of center, new steering wheel, and repositioning of rear seat cushion in four-door sedans. Beginning at the low end of the totem pole, '58 Plymouth powerplants start with the PowerFlow six-cylinder, 230-cubic-inch engine, developing 132 bhp; standard engine on all V8 models except Fury is 318-cubic-inch modified version of the 1957 Fury engine. With a 9 to 1 compression ratio and two-barrel carburetor, this "Fury V-800" develops 225 bhp at 4400 rpm. An optional power kit consisting of a four-barrel carb, distributor with revised advance curve, dual exhaust, and hot cam is available for this engine. Two four-barrel carburetors, double-breaker distributor, dual exhaust, and a still hotter camshaft is the standard engine on the '58 Plymouth Fury; its horsepower rating is 290 at 5200 rpm. Still another engine, the "Golden Commando V8", a 350-cubic-incher with either twin quad carbs or a Bendix electronic fuel injection system, is optional. Special high-performance chassis equipment usually goes with either of these "hot" engines. Power output is 305 and 315 bhp at 5000 rpm. (See Plymouth road test, page 52.)

Pontiac



Common to every Pontiac for '58 is an all-new Fisher "A" body shell shared with Chevrolet, mounted on an "X" frame (without conventional siderails) similar to that used by the '57 Cadillac. Styling is long and sleek, with embellishments that give sparkle and distinction to previously considered conservative line of cars. Sixteen models in four series, including newly introduced Bonneville series of family-size "dream cars," are offered. Big-car look claim is backed up with overall increase in length of 8.7 inches, width by 2.2 inches, while height of top-line Bonneville coupe is only 55.6 inches off ground, difference of 4.4 inches from '57 sedan. New for '58 are coil springs all around, replacing rear leaf springs of '57; a brake anti-dive control is built into new ball-joint front suspension. Optional air suspension includes manual override valve, permitting additional road clearance if desired. Pontiac's V8 block has been bored and cored to 370 cubic inches, from 347, and uses 8.6, 10, or 10.5 to 1 compression ratios. Two-throat, four-throat, three two-throats, or fuel injection are optional on every Pontiac model. Horsepower ratings range from 240 to 310, depending on compression ratio and fuel induction system selected. "Sportable" transistor radio pulls from dash, permits playing outside of car for as much as 50 hours on tiny batteries.

Rambler



Rambler's concept of compactness and economy established in past few years will continue in their '58 models, with no radical changes from '57. Eleven models—station wagons, sedans, hardtops—in the Six and V8, the latter known as Rambler Rebel, are built on comparatively short 108-inch wheelbase. Six-passenger, roomy interior has seats with changed rake, height for greater comfort; "Airliner" reclining seats, still optional, give mattress-like softness without sag. Engineering improvements include pushbutton control for automatic transmission, larger brakes, a step-on parking brake, and optional Powr-Lok differential for V8 models. Latter improves performance while driving through sand, mud, snow, or ice. Six ohv engine is upped to 127 bhp, compared to 125 for '57 model; optional twin-throat carb boosts rating to 138 hp. V8 develops 215 bhp, up from last year's 190. Borg-Warner's Flash-O-Matic replaces fluid-coupling Hydra-Matic on '58 models. Five-button transmission control is to left of steering column on dash, along with controls for Weather-Eye heater and All-Season air conditioner (optional), all lighted for easy night operation. Transistor-powered radio uses air vents at either side of dash panel top to emit music through speakers. Full-width crash pad and padded sun visors are optional. Slightly smaller glove compartment, flanked by an ashtray at either side, is center-positioned in dash above radio controls. Station wagon models again feature notched roof with chrome travel rack, and roll-down rear window. Structural changes have strengthened unit-frame body.

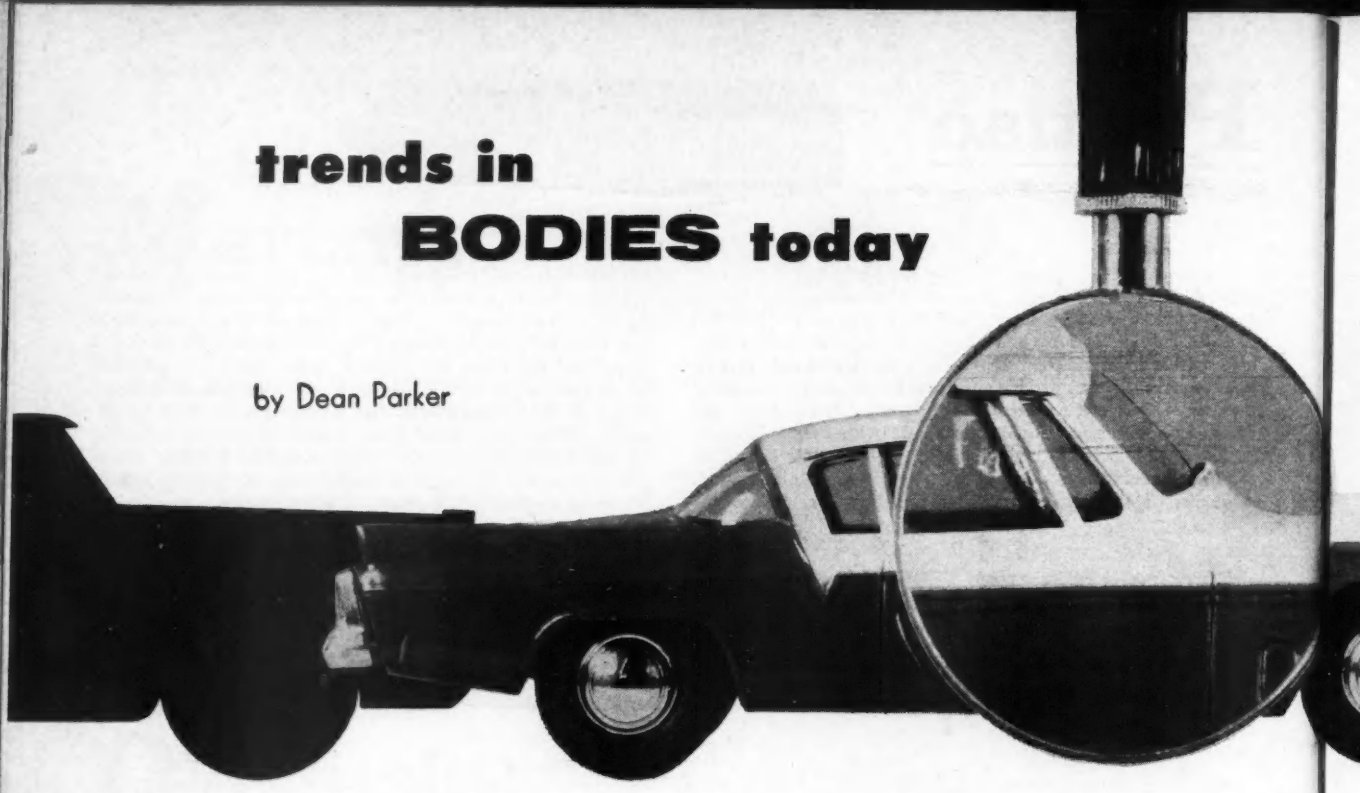
Studebaker

Thirteen different models in five series are Studebaker's offering for '58. Styling remains essentially same as in '57 models; however, dual headlights, canted fins modeled after those introduced on Hawks last year, and lowered silhouette are features. One-piece driveshaft and 14-inch wheels, standard on all V8 models and optional for Champions, made lower height possible. Suspension improvements include longer rear leaf springs, flexible link-type stabilizer bar, giving less braking nose-dive and rear-end "squat" under hard acceleration. Laterally finned brakes, limited-slip differential, which Studebaker-Packard introduced two years ago, are continued. Engine lineup for '58 essentially same as '57, with minor exception whereby President models, using 289-cubic-inch V8, will be equipped with single four-barrel carburetor as standard equipment instead of as an extra-cost option as last year. Commanders and Provincial station wagons continue to have 259-cubic-inch V8 rated at 180 hp; with optional four-barrel carb, dual exhausts, this is boosted by 15 hp. Scotsman and Champions have same 101-hp flathead six with displacement of 185.6 cubic inches. The Golden Hawk V8 will still be offered with supercharger equipment. Super-safety Captive-Air tires, which eliminate need for spare, are installed on Hideaway Seat wagons. /MT

Information on the 1958 Cadillac is on page 26 and on the 1958 Packard on page 22. Data on Rambler American and Thunderbird will be in a forthcoming issue.

trends in BODIES today

by Dean Parker



1938

IT HAS BEEN PROVED time and again in the last four or five years that *body styling* is by far the most important sales factor in the American car market. Engineering features, ride, performance, fuel economy . . . they all take a back seat to looks. And this new emphasis on styling has warped body engineering trends in weird ways. The stylist has forced compromises on cost, weight, rigidity, roll-over safety, and seat comfort that would have been unthinkable even five or six years ago. The cost department might not release an extra 26¢ to put more durable springs in the seats; but the stylist should have no trouble getting that 26¢ to put another chrome spear on the hood. All for the "saleable package."

This is the key trend in design today.

Europe is only on the threshold of the era. They couldn't sell their homely Volkswagens and Fiats and Austins if functional styling weren't acceptable to the masses. But notice also that Europe has been consistently about five years behind us in these matters. They're coming along. The trend to radical, flashy styling over there should parallel improvements in living standards —which means we can look for the first big breaks in Germany. Already the masses there are breaking their backs to get out of the VW class, and highly-styled Mercedes-Benz and BMW sports coupes are the talk of the town.

But to get down to specific cases: There are two great trends at work today in the field of auto body design. The first is this modern trend in styling — to a longer, lower, wider car, with more and more glass area above the belt line. The second is the trend to unit construction (where the body is designed as a sturdy box unit, without a separate under-frame, and the running gear is attached directly to the body unit). The big question is simply this: Do the modern styling trends clash with the engineering requirements of an efficient unit, or "monocoque," structure?

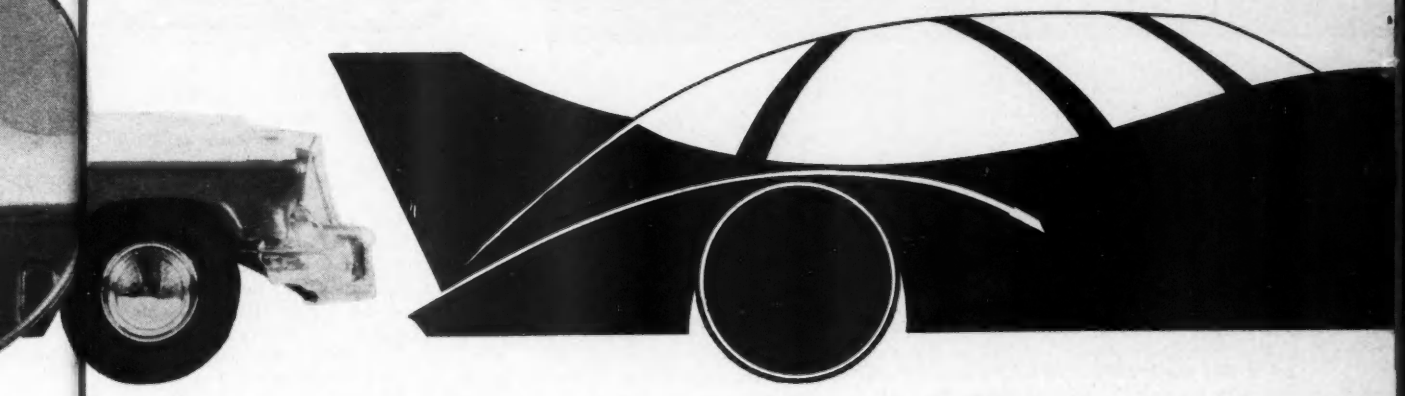
There has certainly been no clash in the past. The first unit car design is generally credited to Vincenzo Lancia in 1922; he claimed great body rigidity and an important saving of weight for his idea. Nobody paid much attention, mostly because there was no developed science of monocoque structural design in those days. Detroit wasn't interested because they change body lines too frequently, and this costs more with the complex unit construction tooling. Then in the early '30s the French Citroën people, pressed by impending bankruptcy, developed a brilliant front-drive unit body car that could be produced in quantity for a very low price. It turned out to be one of Europe's most successful cars — and was continued for 20 years without major changes!

IN THE LAST 20 YEARS Europe and America have split on unit construction. Europe has gradually switched over to the unit concept, until today over 90 per cent of their production features it. To the overseas car producer, who uses one set of body dies for anywhere from four to 15 years, unit construction offers a nice way to save 100 to 200 pounds of high-priced steel in a separate frame. The original tooling costs more, and it costs more to make minor body changes; but this is of little importance when you don't make frequent changes.

It was even practical in some cases for Detroit years ago, when one basic body shell was used four or five years. Several of the smaller U.S. producers tried it with considerable success. There were the Cord and Lincoln Zephyr in 1936; Nash started it on the famous "600" in 1940; Hudson went to a modified unit setup in '48. Today the press of two-and-three-year die runs would appear to make unit construction much less attractive to Detroit. It looks expensive on paper . . . and, in fact, only two per cent of our total 1957 model production (American Motors) used unit

Public preference for the longer, lower look has forced engineering concessions to body styling.

How long will this trend continue—and what may the ultimate compromise design look like . . . ?



1968?

construction instead of frame plus body.

We could probably leave the question right there if it weren't for the fact that Lincoln has just put up a brand new factory to produce unit bodies for 1958. The development forces us to take another long look at unit construction in terms of the American passenger car. The Lincoln people decided to make the switch originally to get a stiffer, quieter body with a low floor line—and one that could effectively use a trailing-link rear suspension that would be adaptable to air springs. In the past most unit bodies have proved to be 30 to 50 per cent stiffer in beaming and torsion than conventional body-frame combinations; the floor line can be brought as close to the ground as you want; the floor structure can be adapted to a wide variety of suspension layouts. On paper it seemed like a cinch for a low-production luxury car.

BUT NOW LET'S LOOK behind the scenes. Lincoln has been anxious to move out of their crowded, obsolete downtown Detroit quarters for years. The new factory in suburban Wixom gave a perfect opportunity to switch all production facilities to unit construction. As a matter of fact, it is almost impractical to convert an existing plant from frame to frameless construction because of the radical differences in assembly procedures, sub-assemblies, conveyor lines, etc. With frame construction, for instance, the frame is the basic assembly unit, with most components added to it on the line. The body is dropped on last of all. With unit construction the *body* becomes the basic assembly unit; it is carried along on massive overhead conveyors, and much of the assembly is done from pits below the floor. Converting an existing plant from frame to frameless construction during the usual two or three-week model change period would be an impossible task. (And don't forget the problem of assembly plants dotted around the country.)

This matter of plant conversion is definitely a key factor holding back any general switch to unit construction in the U.S. auto industry.

And there are other serious bugs. We're not at all sure at this point whether modern styling trends are even *compatible* with the unit body concept. Recent bitter engineering experiences at Lincoln smashed this home. Look at it this way: On a unit car body the roof is a major stress-carrying section of the box structure; to do its job properly it must be tied into the lower sections with relatively heavy bracing. One look at a late hardtop body—with no center pillar, huge wrap-around windshield with thin, spindly frames, and acres of glass area—is enough to scare any unit body proponent out of a year's growth. You just can't put the roof to work with a setup like that. Result is that the floor and side structures must be made much heavier to get adequate overall stiffness to prevent rattles, squeaks, loose door fits, etc. You lose the advantage of a *box* structure; all you have is a *platform* with rigid sides. And a long wheelbase, with lots of overhang, only makes it worse. It's an engineering fact that the beam and torsion stiffness of a structure fall off rapidly as the length increases. Overall result: You could end up with more steel in the floor and sides of the body than if you put a separate frame under it!

This is exactly what happened to Lincoln. Their first experimental '58 models weighed 4400 pounds . . . and collapsed like an accordion on test runs. They started adding steel. A later run of pilot production models weighed 5100 pounds, and they still weren't stiff enough for a luxury car. Current production models weigh *5600 pounds!* (They need those 430 cubic inches in the engine more than they thought!) The fact that the new Lincoln is the largest unit-construction car ever produced aggravates the problem. The

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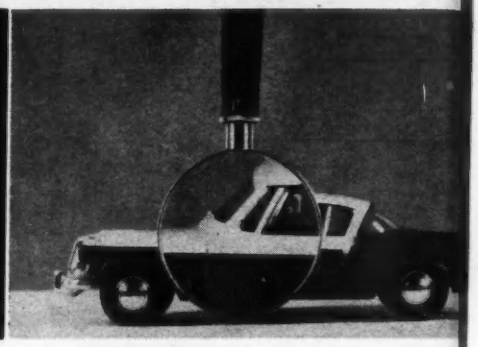
"In Europe, unit **body style** has won out over separate frame construction; in the U.S., styling philosophies and conversion problems prolong the battle."



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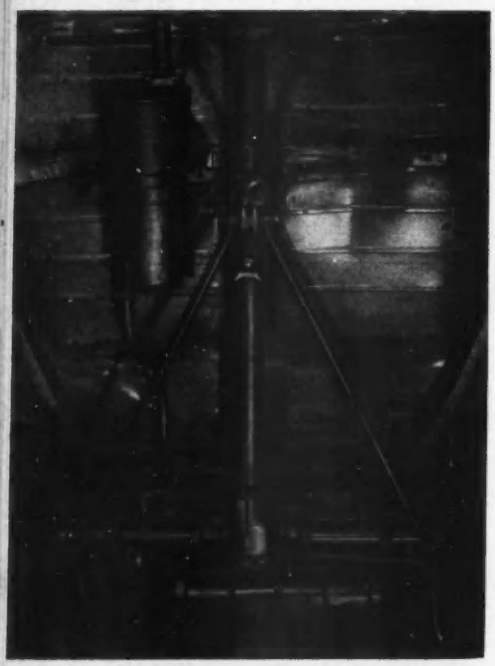
smaller American Motors lines and the new Thunderbird are not nearly so critical on this stiffness angle—though it's a fact that they have no apparent weight advantage over equivalent cars with frames (which, on paper, they should have).

So it would seem from all this that modern styling trends *are not,* in fact, compatible with the unit construction theme. Or maybe only shorter, smaller cars will be able to benefit from it. Or maybe it will take some strong transparent plastic — which would make it possible to stress the "glass area"—to make unit construction practical on tomorrow's car. You can find smart engineers on both sides of the fence. Only time will tell.



NASH started unit-frame construction with its famous "600" back in 1940. Here is underside of more recent car.

MODERN STYLING TRENDS have triggered many other body engineering problems besides basic construction. Removal of the center pillar on the hardtop body has caused a serious loss in roll-over rigidity; one of these will collapse under much less load than an early "turret-top" body of the '30s. The spindly frames used to lower the height of several '57 models have caused a big loss in beam and torsion stiffness of the body-frame combination—as compared with '56 models that were three or four inches higher. Cadillac has the best low-height frame today (and this design has been adopted by Chevrolet and Pontiac for '58).

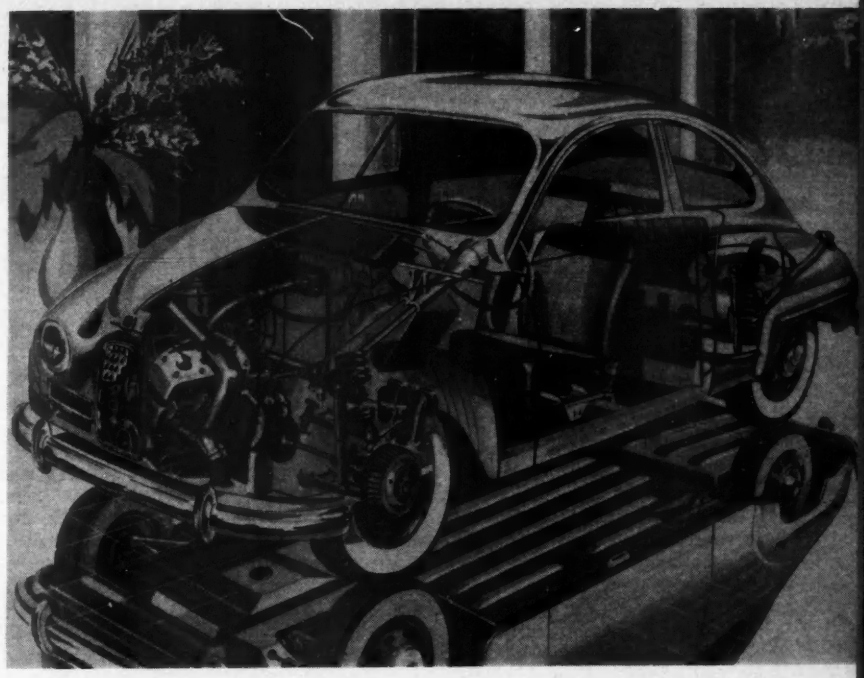
Reducing body height is a science in itself. The low look has been one of the most successful styling gimmicks in Detroit's history—and you can bet they'll milk it for all it's worth. In years past overall body height was always more a function of *chassis* design (wheel diameter, frame and drive line height, etc.) than of interior space in the passenger compartment. Up until about 1955 most designers wouldn't think of cutting into the passenger's space to whack an inch off body height. Today . . . well, look at Chrysler: They used to make a big point of their "chair height" seats—14½ inches of solid comfort on the '54 models. Today those seats are 11 inches high. Are 1957 model human beings comfortable in lower seats than '54 models??

Actually, there's got to be a low limit to this car height business. The average height of the human torso is about 34 inches; we should add at least four inches to this to allow for taller people and hats. Ground clearance should not be less than maybe six inches, to allow for back roads, grease racks, driveways, etc. This gives a total of 44 inches that we can't touch in reducing body height. The body roof structure, with upholstery, will take up another inch or so. The floor structure is "open to negotiation," so to speak. Unit construction and certain frame designs (like the Cadillac "X" and Ford bowed design) permit the floor to be dropped right to the ground clearance line. We probably shouldn't charge more than an inch to floor structure; the driveshaft has been above the floor line for years—though this inch won't allow space for an exhaust pipe and muffler.

The seat appears to be the most promising spot to shave height. A low seat doesn't necessarily mean an uncomfortable seat. But low seats must be carefully contoured, with special padding under the thighs. The conventional automotive "bench"-type seat is not adapted to the job—largely because of the driveshaft tunnel, and partly because of the contouring problem. A compressed seat height of four inches is a practical goal, but it will take a form of bucket seat to be really comfortable. (And they're going to have to do a lot better job than they have on the bucket seats in some sports cars.)

So this leaves us with an overall car height of 50 inches as a practical limit for tomorrow's car. Even this would require some sort of automatic constant-level suspension that would maintain this height with varying loads. (A serious drawback with conventional steel springs is that standing height must be a compromise between light and full load.) Additional gimmicks you'd need to live with a 50-inch car would include doors that open into the roof, possibly swiveling seats, maybe a swiveling steering wheel that could be swung to one side—and you would need some sort of independent rear suspension with chassis-mounted differential, so the driveshaft wouldn't move up and down. One bug you'd have to learn to live with would be the shortening of forward visibility caused by the driver's eye being closer to the ground. Until all our roads

IN EUROPE, 90 per cent of all car production features unit concept of body-frame construction. Using only one set of body dies from four to 15 years makes it practical. This mirrored shot of the Swedish Saab reveals the structure of typical undercarriage.



are super turnpikes this will be a very real problem.

WHAT DOES THE NEAR-FUTURE hold for the American passenger car body (and the European body eventually)? Well, for one thing, the battle between unit and frame construction will continue until one wins out. The recent Lincoln experiences will be considered a setback by some—a brilliant victory over tough technical odds by others. Unit construction has won in Europe, and it is doubtful if they would go back to frames on any future designs. Monocoque construction has long been exclusive in the design of aircraft, rail cars, and buses. It seems logical that it will come in car bodies, too. But, if it does, it's bound to be a gradual evolutionary process, possibly requiring five or 10 years.

No discussion of body design trends would be complete without mention of the "off-beat" body—the retractable hardtop, the pillarless sedan, the sedan-type pickup truck (like the Ford Ranchero). Today's off-beat body is usually tomorrow's hot production design, as witness the two- and four-door hardtop. Actually, since body styling is definitely *the* most potent sales force in today's market, it would appear that there would be more hay in new body types in the next few years than in advanced engineering features like air suspension, fuel injection, advanced transmissions, etc. Whether Detroit is actually spending more research dollars on bodies, however, is doubtful.

But you're bound to see some pretty radical developments in the next five years. The success of the Ford Ranchero, for instance, suggests a trend to more highly-styled light trucks. We generally think of a commercial truck-user as interested strictly in function . . . but who really knows until we try to sell him function *and* style? Same deal with the station wagon. The late fancy models have proved that people are interested in more than function here. So why not go all-out and try something really special—like maybe a *convertible* station wagon? And on the

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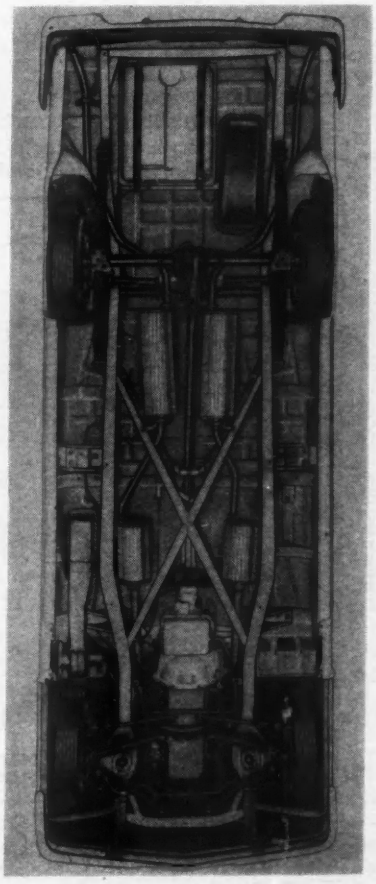
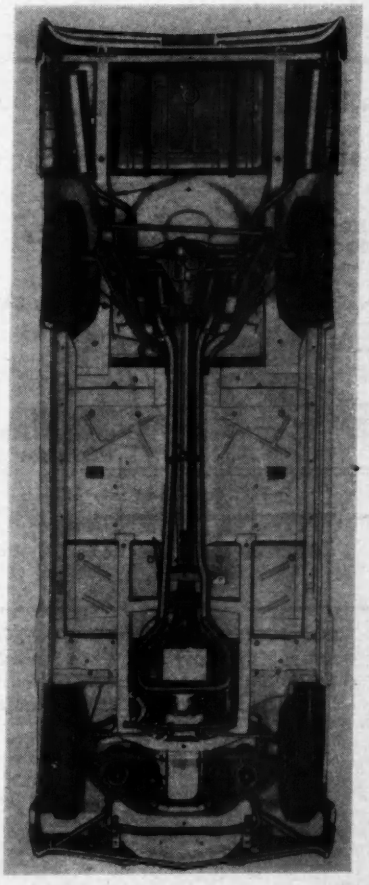
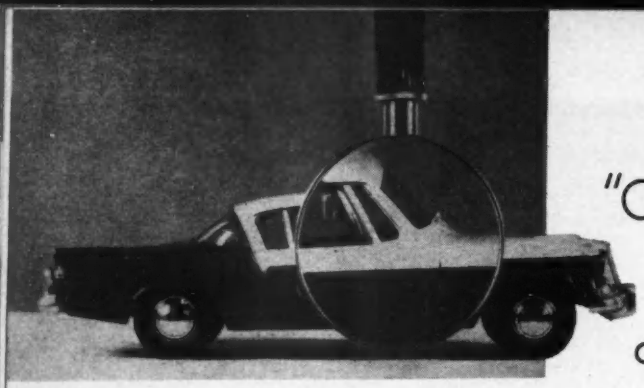




BOTTOMSIDE COMPARISON of frame '57 and unit-body '58 Lincoln indicates possible U.S. trend toward stiffer bodies with lower floor lines.



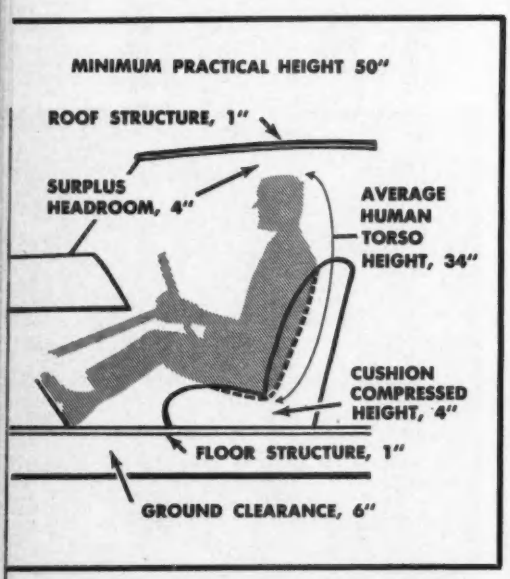
"Off-beat **body styles** are making inroads into today's designs— a forecast of future trends . . . ?

continued

subject of convertibles, many body stylists think that the convertible feature would have tremendous appeal if the car could be made more practical as a *closed* car—without the leaks, drafts, and fast-wearing soft top. Ford's retractable hardtop is the first step toward this new concept. It's bound to start a trend, crude as it is. The retractable hardtop could one day out-sell the conventional sedan body.

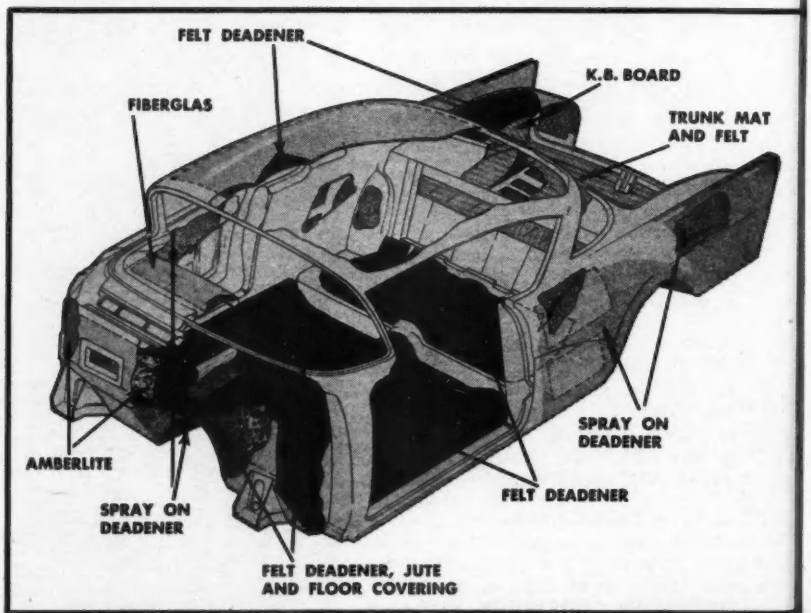
Styling trends will likely follow present themes for at least five years—that is, the long, low, wide look, with lots of glass area. The next big styling gimmicks will be fantastically-sculptured panels, more rounded body sides, and much steeper slants to the windshield. The current trend to longer lengths is partly to get a car that *looks* lower; perhaps if we could whack another three or four inches off the height with bucket seats and independent rear suspension we could shorten the bodies some without taking away the sleek, fast look. And two other questions immediately come to mind: (1) Will "GM" styling—characterized by the high, blunt hood, thick roof, and boxy lines—diverge further from the more sleek Ford and Chrysler lines . . . or will they come closer together; and (2) when Europe starts to go wild with the sheet metal, will they follow U.S. styling themes or those of the exotic Italian custom school? Only time will answer these questions.

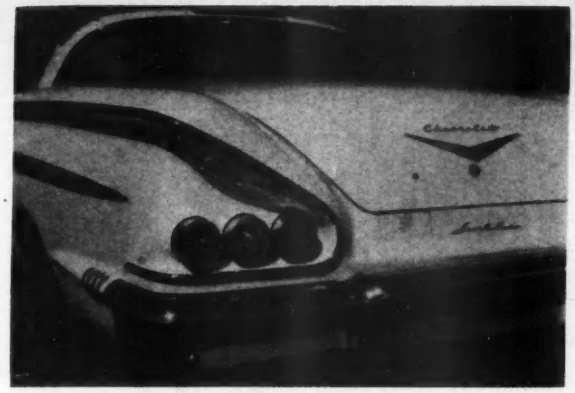
One thing is quite certain: The stylist is going to crack the whip over the body engineer for a long time to come. Today's low seats and doors, huge driveshaft tunnels, knee-cracking wrap-around window frames, complex, glaring dash panels, and 18-foot lengths are only the beginning. John Q. apparently wants this sort of thing—he's certainly *buying* it these days . . . and you can bet that Detroit will be right there to supply it. /MT



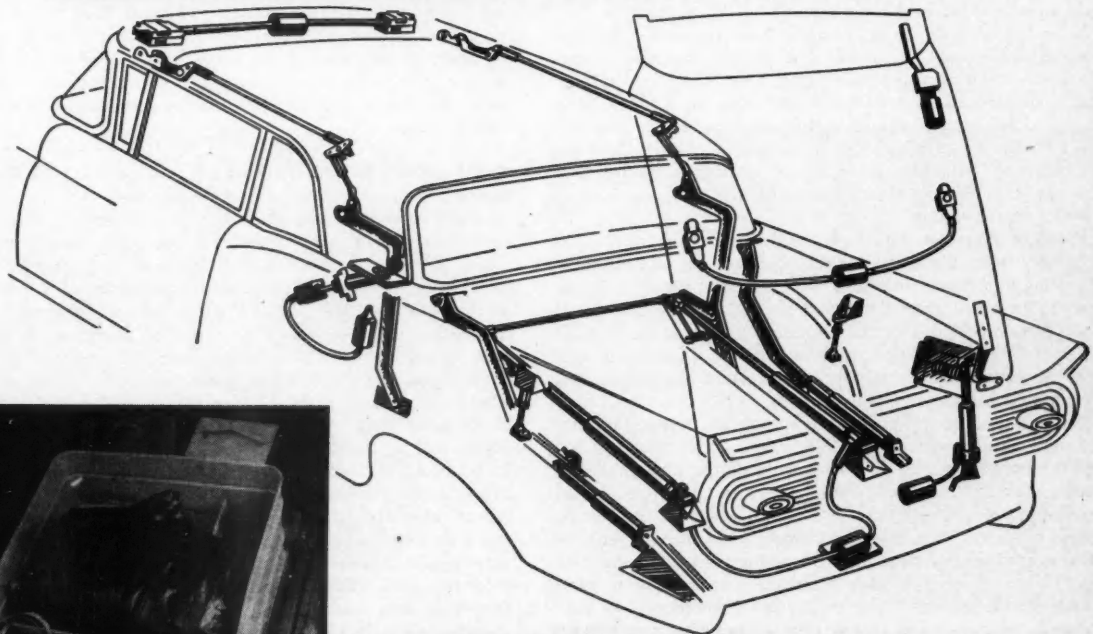
MOST SUCCESSFUL STYLING GIMMICK has been the "low look," but there is a definite limit to car height, as related to the height of the human torso.

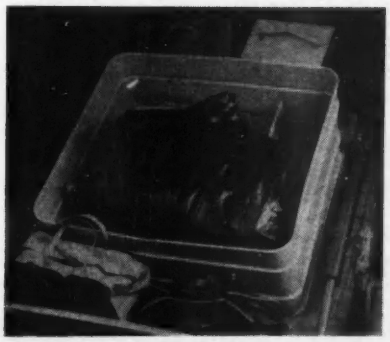
IMPROVED INSULATION METHODS as practiced by most of the Detroit body builders is in store for 1958 car buyers. Sound deadeners include Fiberglas, Amberlite, felt, and special spray-on acoustical materials.



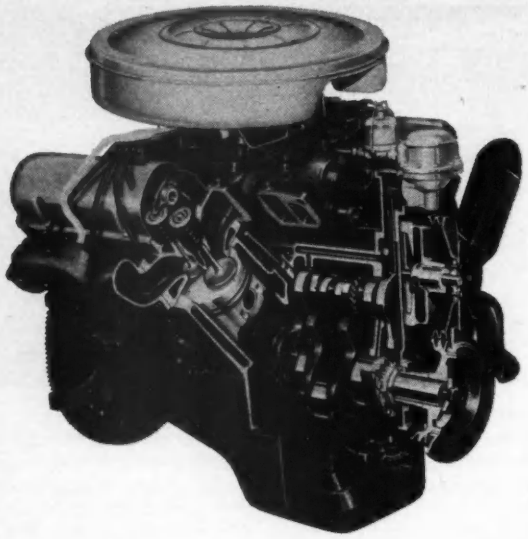


EXTENSIVE "SCULPTURING" of body metal is quite evident in most of the 1958 American cars. Good examples here show the Chevrolet Impala rear fender treatment (left, above), the indented rear deck of the Studebaker Hawk (right, above), and reverse-curved sections in Continental (below).





TODAY'S "OFF-BEAT" BODY often becomes tomorrow's hot production design, like the two- and four-door hardtop. Ford's retractable hardtop, despite its complicated mechanism and limited luggage space, is gaining popularity.



trends in ENGINES today

by Dean Parker

YOU'VE READ AND HEARD the word "revolutionary" a lot in Detroit advertising. It's seldom applicable. Major innovations like independent front suspension in 1934, fully automatic transmissions in the '40s, the short-stroke overhead-valve V8 engine in '49, and Chrysler's "Flight-Sweep" styling could be called revolutionary . . . but certainly nothing as unimportant as stamped rocker arms or even fuel injection.

One of the hardest things for the auto enthusiast to understand is the apparent plodding, complacent attitude in Detroit about mechanical improvements. Three or four years ago the crystal ball gazers were talking about aluminum cylinder blocks, weird combustion chambers and valve layouts, superchargers, overhead camshafts, 12 to 1 compression ratios, and such. Supposedly we could look for them on the new crop of '57-'59 engines.

What you actually see is *evolution*—not *revolution*. All the above gimmicks may be coming, but in their own sweet time. This is the way it's got to be in a highly competitive, close-profit-margin business like our auto industry. John Q. is much more willing to pay for styling and performance he can see and feel than for technical improvements he doesn't understand. Until the technical improvements can be added without increasing cost we'll just have to wait for evolution. Keep this in mind when studying engine trends.

Probably the major engine problem in world automotive design today is the old battle between performance and economy (economy in this case including the first cost of the car). It was never more critical than it is today. The price of gasoline in all parts of the world is shooting up almost as fast as the demand for improved acceleration, and competition on initial car cost seems to get tougher every day. The situation has had a great influence on basic engine design trends.

For instance, the cost problem is so tight in Europe that they just can't afford the luxury of a V8 engine. Small four- and six-cylinder layouts are the rule—but with all the modern design features like short strokes, crankshafts with plenty of journal "overlap," super-rigid blocks, big valves, advanced combustion chamber shapes, etc. In general these small foreign engines develop considerably more effective performance *per cubic inch* than large U.S. engines. This is because they have more valve breathing area per cubic inch (a physical phenomenon we can't do anything about), and because they can use more rpm without burning an excessive amount of fuel. Over here the average buyer won't put up with the noise and vibration of a small engine. Valve area per cubic inch goes down as the cylinders get bigger, and friction losses in the higher rpm ranges are fat on big engines—so you can't turn them fast without guzzling gas.

The result of all this in Detroit has been the development of huge, high-torque V8 engines, geared to run at very low piston speeds. Primarily this gives us a short, compact powerplant that is beautifully adapted to modern body styling trends. The lower end is rigid enough for future compression ratios above 12 to 1. Performance-wise, we have an extremely smooth, quiet engine that will give reasonably good gas mileage at cruising speeds . . . . . and one that will really dig down and haul when you wind it up in the transmission "kickdown" range. The overall acceleration, of course, is much better than the small European cars. Normal gas mileage is maybe half as good; but fuel consumption of large American engines is so great in the higher rpm ranges that just a little jazzing nowadays will knock four or five miles per gallon off just like that. Incidentally, this trend to larger displacement and lower piston speed is especially noticeable on the new '58 models. In some cases axle gear ratios have dropped *more* than torque has increased, so the acceleration trend may level off some.

MANY MINOR DESIGN TRENDS are at work today shaping the engine of tomorrow. Combustion chamber and valve layouts are especially interesting. These have to be considered together because the choice of, say, a certain combustion chamber shape may dictate the valve placement—and vice versa. For example, when the Chrysler people brought out their new series of V8 engines in the early '50s they decided on an advanced hemispherical combustion chamber—one that could be developed in future years to give superior performance and fuel economy on relatively low-octane fuel. They figured then that pump octanes would not increase rapidly during this decade (largely because of the questionable Korean situation then), and they wanted a design that would not depend on high compression ratios for its performance. So what happened? The Korean situation blew over and pump octanes shot up at a rate that surprised everybody. All of which left Chrysler with little performance advantage, and a *very* expensive engine to produce (what with the double valve angles, double rocker shafts, massive head castings, etc.). Now they're back with the rest of the industry—and practically the whole auto world—using the basic wedge-type combustion chamber. Only Buick now holds out against the trend in our industry.

Actually the wedge-shaped chamber seems right for the modern overhead-valve automobile engine, and it's going to take something quite special to oust it. It's a beautiful compro-

The search for less costly engines has fostered many design improvements—

and promises a further bonus in performance and economy.

mise between costs, performance, smoothness and economy. The valves can be placed in line and parallel in the heads for minimum cost. You can get larger valves into a hemispherical chamber (for a given bore diameter) because of the angular placement; but the lack of turbulence in this type of chamber raises the octane requirement—so you can use a considerably higher compression ratio with the wedge chamber. The two effects may nearly cancel, though it's more probable that the hemispherical chamber has a slight edge in performance potential. But the higher compression with the wedge gives good fuel economy, and the turbulence gives a more gradual pressure rise on combustion, for a smoother engine.

As far as this goes, the new form of combustion chamber in the cylinder block, as used by Chevrolet and Ford on their new '58 engines, is only a development of the basic wedge theme. All the above principles apply here. Major advantage of the new design is that we can get a *fully-machined* chamber surface at minimum cost. A machined chamber surface is very desirable at higher compression ratios—almost a necessity, in fact—for two reasons: The first concerns carbon and lead deposits in the cylinder. "Surface ignition" (or pre-ignition) caused by these hot deposits can become relatively more critical than normal detonation knock at very high pressures. The deposits will not cling so readily to a smooth machined surface. A second factor is that this machining allows closer production control of combustion chamber *volume*. As compression ratios go up the chamber volume becomes relatively smaller, so minor casting irregularities can cause wide differences in compression ratio between cylinders—and give a rough-running engine. Machining solves this one quickly.

So you can look for all future combustion chamber shapes to be designed with an eye to economical machining. (Ford has even managed to machine the wedge in the head on their new junior engine, but it's costly.) Europe isn't being pressed by the problem just yet because available pump octanes are not high enough; but they will eventually.

Chevrolet engineers have been able to make the new block wedge chamber pay off in valve area, too. That is, when the block face is milled off at an angle less than 45 degrees from the horizontal on a 90-degree V8, the bore opening becomes an oblong elliptical shape, rather than a true circle. The ellipse has more area than the circle, so you can fit larger valves on the head surface that goes over the bore opening. But this is true only if you *stagger* the valves along the length of the head. Chevrolet can conveniently do this with their ball-joint rocker arms; but Ford uses a single rocker shaft, so their valves have to be in line. You may see GM using their ball-joint rocker patents for other unusual valve layouts in the next few years.

AFTER COMBUSTION CHAMBERS and valve layouts, the most significant engine design trends today appear to lie in the fuel feed system—carburetion, manifolding and porting. There has been a lot of new thinking on this business in the last three years. Back in the early '50s Detroit engineers used to design their fuel feed systems primarily from the standpoints of economy and flexibility, at the sacrifice of top-end performance. Carburetor venturis were small, ports were small, and they even deliberately designed *sharp bends* in the manifold passages to promote turbulence in the fuel-air mixture. The engines gave wonderful gas mileage (in view of the low compression ratios), and low-speed torque and throttle response were excellent.

That's all a thing of the past today. With our late torque converter transmissions we don't need low-end performance—and we're getting our fuel economy (what there is left of it) through ultra-high axle gear ratios, careful carb jetting, and high compression ratios. But carb venturis, ports and manifold passages are huge; the tiny fuel droplets all but get lost on their way to the cylinders at cruising speeds! These low air velocities

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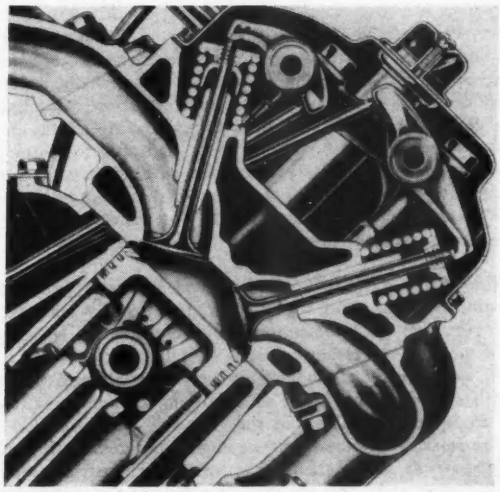
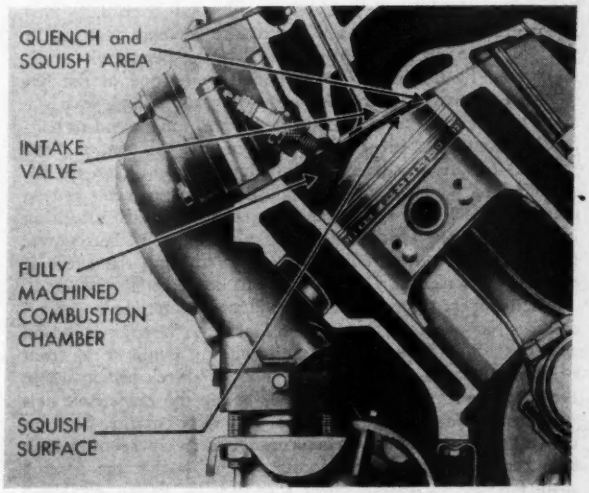
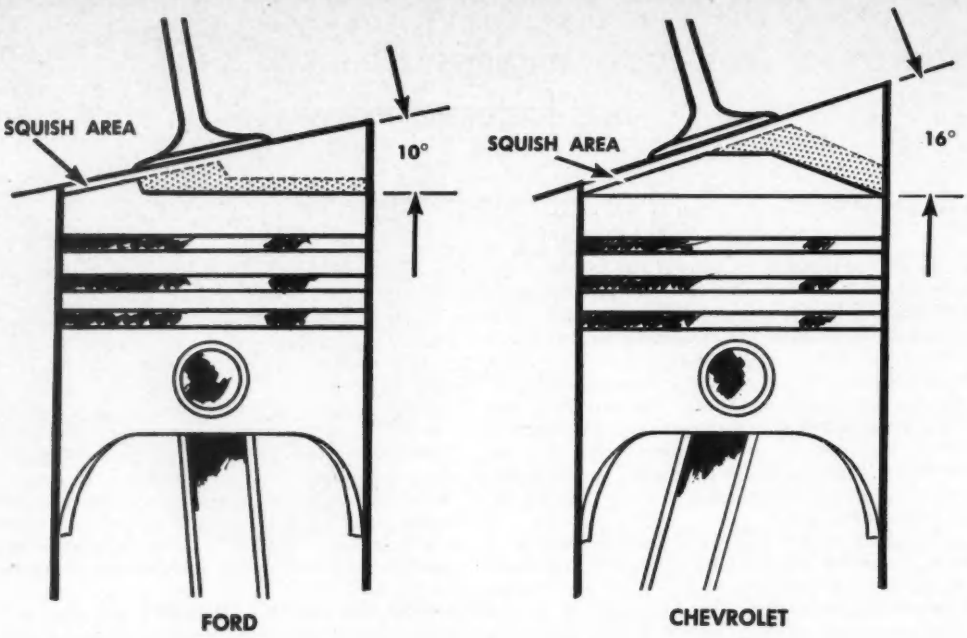


HEMISPHERICAL CHAMBER, brought out by Chrysler in the early '50s, seems to be relegated to shelf for future because of high-cost-of-production factor. It is still used, however, in Dodge "Red Ram V8," Chrysler "Firepower," and the Imperial.



WEDGE-SHAPED HEAD, as adopted by more and more engine builders, looks just about right for the modern overhead-valve engine. It's a compromise between costs, performance and economy. Chevrolet's head (above) can use higher compression ratios in future modifications.



BOTH FORD AND CHEVROLET have adopted the wedge-shaped combustion chamber in their '58 engines. Only Buick now holds out against the trend in the U.S. automotive industry. Higher compression with wedge gives fuel economy; turbulence gives gradual pressure rise on combustion; result: a smoother engine.

continued
through the inlet system at part throttle definitely hurt gas mileage. The Europeans don't like the idea. With their large valve area per cubic inch they can design the fuel feed for that last mpg and good low-speed flexibility . . . and still get a decent top end. This has been a source of surprise to U.S. auto enthusiasts, but it's really quite simple.

Now, of course, fuel injection will solve most of our fuel feed compromises with one blow. There's little doubt that it's the coming thing for cars in all price ranges on both sides of the Atlantic. Naturally a flock of cost and service problems will have to be solved first. It's entirely possible that continuous-flow injection (like Chevrolet's) will prove to be more practical in the long run than the timed systems, like the Bendix electronic setup used by Chrysler. This is bound to be one of the hot technical controversies in the next few years. Along with the trend to fuel injection you might watch also for a trend to temperature-controlled air feed to the engine. All senior Ford products feature an advanced setup this year, and Corvette has cool air feed to the carbs. With underhood compartments getting more crowded with engine and accessories, the air is getting hotter and hotter. This hot, light air can filch 10-12 horsepower easy in the kickdown range . . . not to mention the effect of cold air on warm-up. Detroit wants to do something about it.

There appear to be no really significant late trends in general cylinder block layout. Three of the four new '58 engines moved the camshaft drive for the distributor and oil pump to the front of the engine, for easier servicing. The "Y" block layout, where the block casting is brought down below the crankshaft axis for better main bearing support, is gaining popularity. Bearings are getting bigger, but not when considered on a basis of bearing area per cubic inch. The important point is that the bearing diameters are increasing faster than widths. When combined with shorter *strokes* this results in more overlap of metal where the main and rod bearing journals connect to the crank arms. These late crankshafts are much more rigid than earlier designs, and contribute a lot to engine smoothness.

How about the aluminum cylinder block? This is coming, too. It will be strictly a matter of dollars-and-cents, though—and it won't be done to reduce engine weight. Die-cast aluminum heads and blocks will require very little machining, so even if the base metal costs four or five times as much per pound as cast iron the overall cost of building the engine in mass production will be less! Biggest problems are the huge die machines needed to cast the blocks. These are being developed.

An unsung—but extremely important—development field in U.S. engine design in the last few years has been progress in cutting manufacturing costs. If V8 engines were still being produced the way they were in 1950 you'd pay $25-$50 more for your new car! The engineers have found literally dozens of simple ways to save costs—stamped sheet metal rocker arms in place of castings; ball joints in place of rocker shafts; valves running direct in the head without separate guides; stamped timing gear covers; intake manifold castings acting as the cam chamber cover and water collector duct; cam cover stamping extended up to act as a gasket between manifold and heads; less expensive alloy materials, etc. Most of these gimmicks not only save costs, but save weight as well. Cost control is a wide-open field for future progress.

SO WHAT WILL the near-future U.S. and European passenger car engine be like? Will the V8 layout eventually take over in Europe? Will the basic piston engine be replaced by some form of turbine powerplant before it is really "perfected"?

Well, certainly by all indications right now the old piston engine has a promising future ahead of it. For one thing, the major engineering emphasis in the next five years will likely be on *suspension* development—so engine progress could well be comparatively slower than it has been in the last five years. Most engineers agree that the turbine engine is the powerplant of the future; but they're not in any hurry on it . . . not when they can build a 300-horsepower piston engine for $100 or so. Meanwhile there are many areas where the piston engine can still be improved radically. There's fuel injection, of course. And we might try getting our performance through rpm instead

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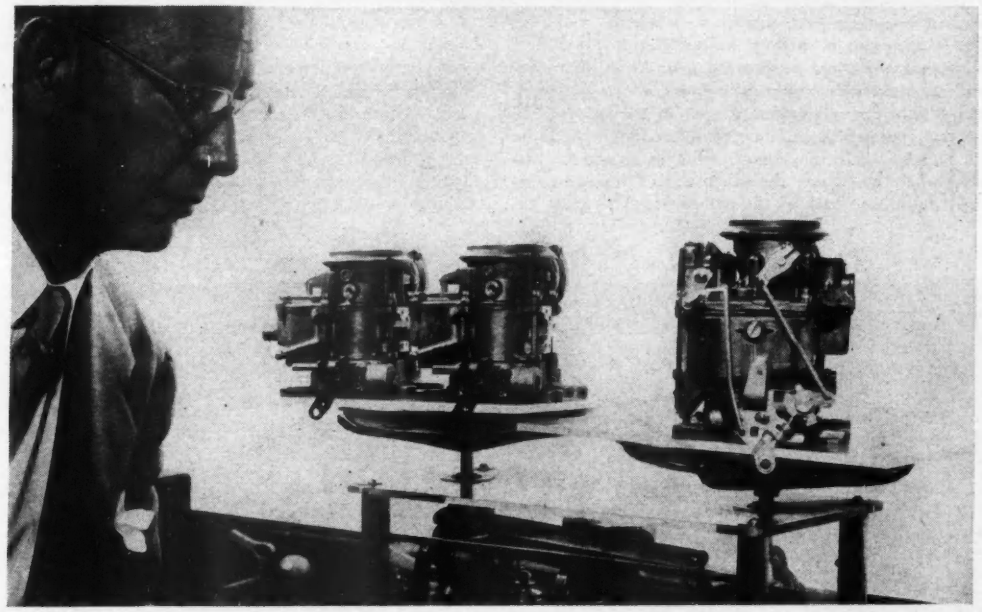
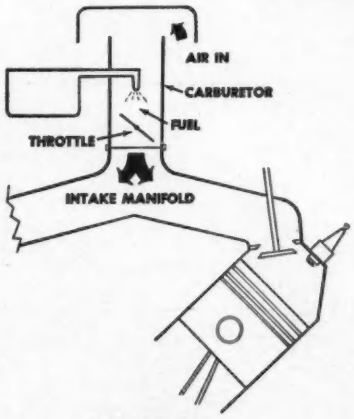
"Fuel injection will solve most **engine** fuel feed problems with one blow. It's the coming thing for cars on both sides of the Atlantic."



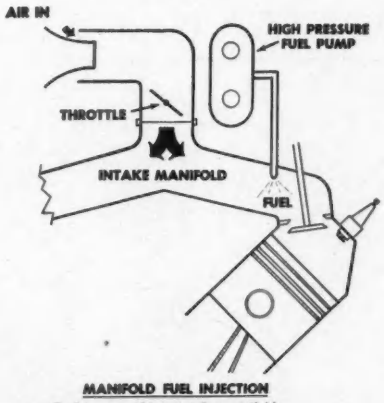
SMALLER CARBURETORS, but with same size working parts and areas as twice-as-heavy bigger models, were developed by Chrysler in 1952 to favor lower hood lines. To meet the increasing fuel needs of bigger engines, current carburetors may soon give way to fuel injection systems.

PRINCIPLES OF CARBURETION AND FUEL INJECTION



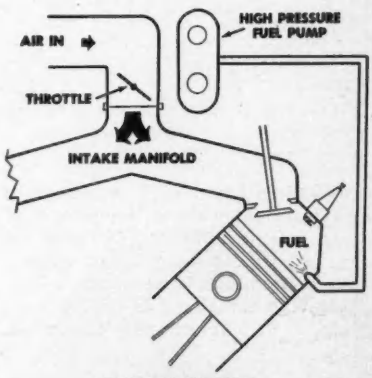
CARBURETOR

Fuel is sprayed from carburetor jets and mixed with air above throttle butterfly.



MANIFOLD FUEL INJECTION

Fuel is sprayed into intake manifold adjacent to inlet valve. Fuel and air are mixed below throttle butterfly in manifold. System may be timed so fuel is injected to coincide with intake stroke of each cylinder.



DIRECT FUEL INJECTION

Fuel is injected directly into each cylinder and must be timed to coincide with intake stroke. Fuel-air mixture takes place in cylinder.

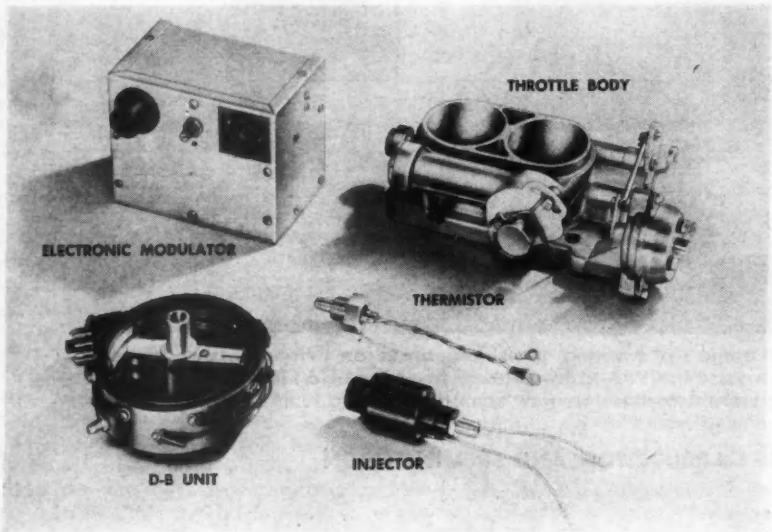
NOTE: This schematic drawing illustrates only basic functions of these systems, and does not necessarily represent details of actual parts.

"Will the basic piston **engine** be replaced by a turbine powerplant? Or, will the engine of the future be a marriage between a piston and turbine unit . . . ?"

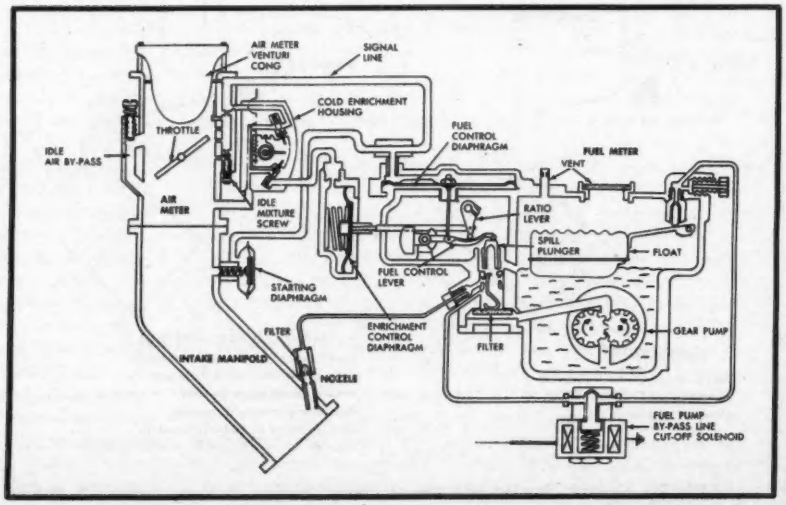
continued

of cubic inches (if noise and vibration problems could be solved); this would give a smaller, lighter engine for future body styles as well as a more economical one. Aluminum construction and superchargers would help here. We might even end up with a light enough engine to put in the rear of the car! Such exotic concepts as engine "compounding" might be investigated. This is actually a marriage of the piston and gas turbine engines—where we expand the exhaust gases through a turbine and feed the torque back to the crankshaft. This trick has done wonders for performance and economy in the aviation field. Why not cars and trucks? Engine life might be extended by sealing the crankcase at the factory with a permanent synthetic oil, with advanced filters and distillers (for evaporating diluted gasoline) to keep the stuff in shape for 100,000 miles!

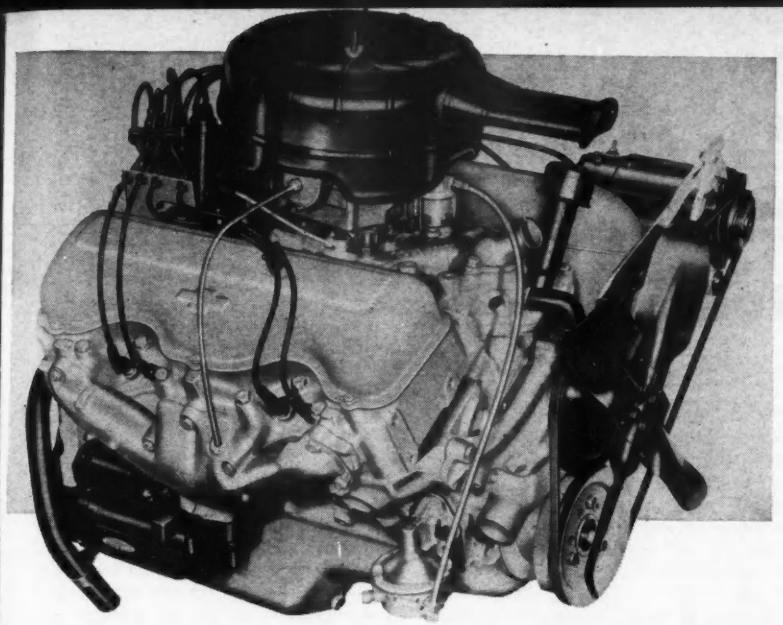
But this is getting pretty far out. For the near term look for major trends to be toward more cubic inches, fuel injection, higher compression ratios, machined combustion chambers, aluminum blocks, and smaller stroke/bore ratios. **/MT**



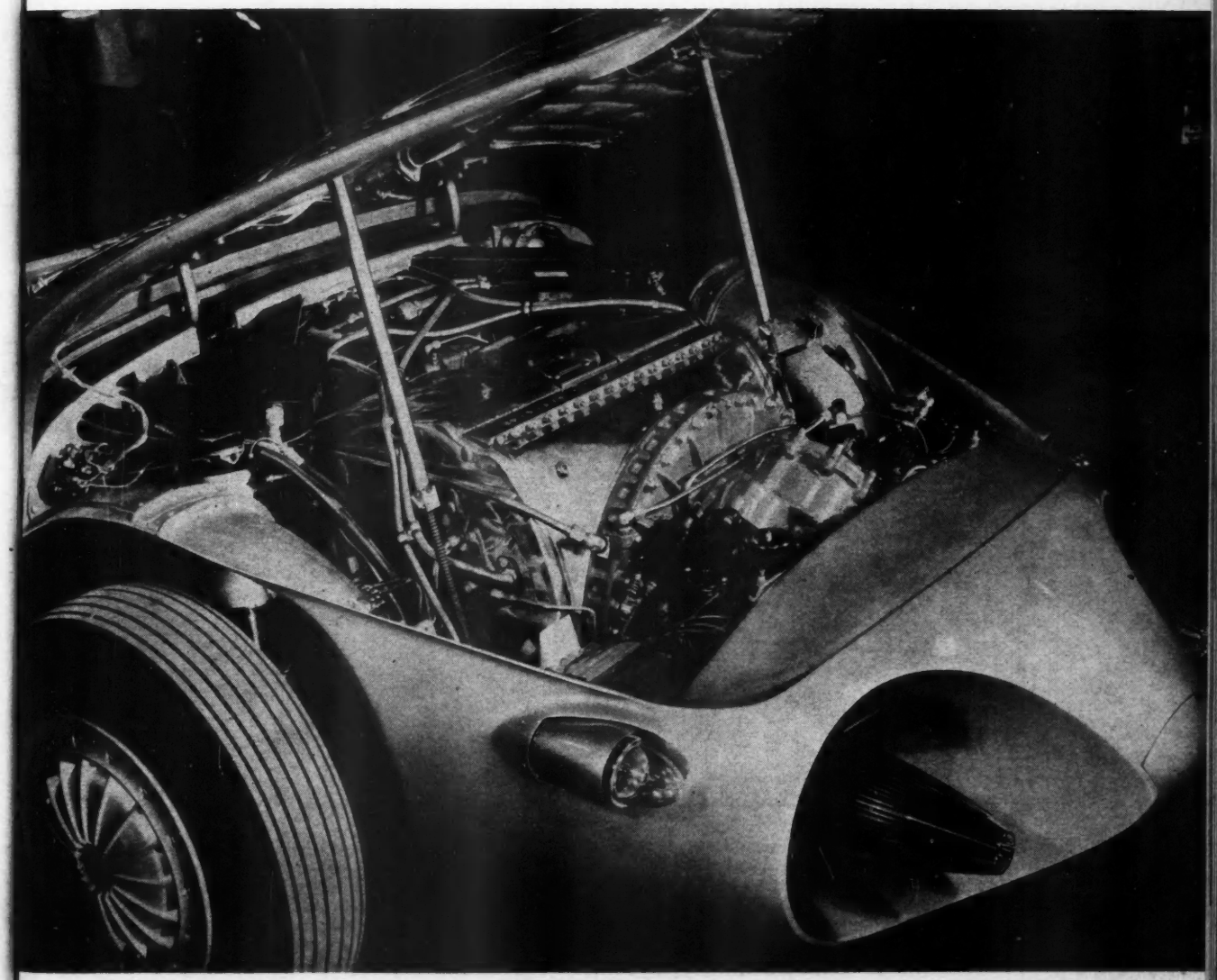
BENDIX "ELECTROJECTOR" fuel injection system uses these basic components. As used on '58 Chryslers, optional, an electric pulse opens injector valves. Solenoid valves work like ignition distributor.



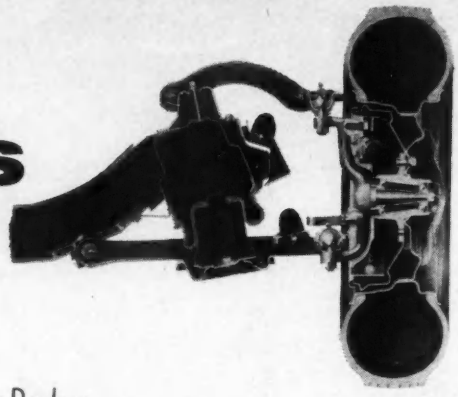
PONTIAC'S fuel injection system in this diagram shows complexity of the installation. Optional on Hydra-Matic-equipped models, system ups horsepower to 310, giving car plenty of scat. It is not electrically controlled.



THE AUTHOR suggests that the future of automotive engines in the U.S. may produce "compounding," a marriage of the piston and gas turbine engines—where we expand the exhaust gases through a turbine and feed the torque back to the crankshaft. Could be—imagine if you can a combination of Chevrolet's latest '58 engine with GM's Firebird turbine, shown here.



trends in SUSPENSIONS today



by Dean Parker

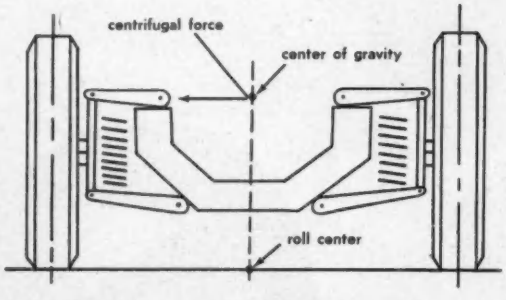
WHEN YOU CONSIDER the vast improvements made in passenger car engines, transmissions, and body styles in the last seven or eight years, improvements made on suspensions seem pretty small—even allowing for the advent of torsion bars and air springs. And maybe they are. Future U.S. automotive historians, in fact, may record that no really important improvements were made between the introduction of independent front suspension in 1934 and independent *rear* suspension, maybe in 1960! Let's face it: Torsion bars and air springs are essentially sales gimmicks. Air springs, at least, will be a nuisance to the service people and a headache to engineers for months to come . . . and they can't really show their stuff until we get unsprung weight down to a decent figure with four-wheel independent suspension. The little unsung improvements in shock absorbers, suspension linkage geometry, and such may be more important to you as a car owner.

Anyway there are bound to be more significant suspension developments in the *next* five years than there were these last five years. Wait and see.

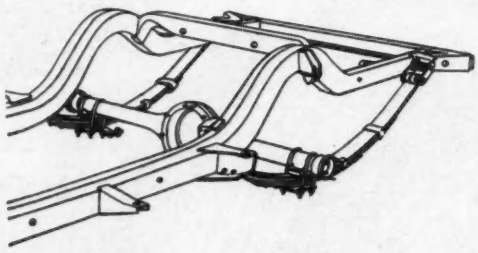
Every now and then the engineers hit on some basic design that is just *so right* for the job it has to do that it will hold on for years and years, while great changes are made on other components. You get the impression that this basic design may be behind the times—when actually there is just no economically practical way to do the job better. This has been the case with basic suspension layouts on American passenger cars.

We were in deep trouble with suspensions in the early '30s. Balloon tires, gyroscopic precession, and soft springs had combined to make "shimmy" and "tramp" life-and-death problems with the solid beam front axles of that day. At this point Maurice Olley and his staff of GM research engineers stepped in with a new form of independent, or "knee-action," front suspension (first used on the '34 Cadillac, Buick and Olds). The front wheels were carried on pairs of parallel lateral A-frames, suspended on coil springs, so one wheel could move up and down entirely independent of the other. The layout—in conjunction with a conventional solid rear axle—solved most of our suspension and steering problems overnight. It has stuck to this day. There have been variations—like coil springs for the rear end with torque-tube drive, cross leaf spring in front, split front beam axle on pivots, trailing arms for the front wheels instead of A-frames, front coils mounted above the A-frames—and, of course, most recently the torsion bars and air springs. But keep in mind that all these special layouts are only variations of the basic theme developed by Olley 25 years ago. There has been no urgent need to change because this layout offers such a beautiful compromise between ride, handling, cost, and body styling.

The European manufacturers, on the other hand, have tried practically everything at least once—trailing arm suspensions, backbone frames, all forms of independent rear suspensions, all types of springs, suspensions that pivot forward and backward as well as up and down. They have been pushed for different reasons. Cost is not the factor over there, so they can afford to experiment; their rough, winding roads invite advanced suspensions; the ultra-lightweight economy car invites weird suspension and drive layouts to control cost, weight and ride; and, of course, the emphasis on the sports-type car in Europe has pushed suspension development. As a result of all this the Europeans are ahead of us in their knowledge of sus-



INDEPENDENT ("knee-action") front suspension was first used on U.S. cars by GM back in 1934. Front wheels were carried on parallel lateral A-frames, suspended on coil springs, so one wheel could move up and down independent of the other, resulting in a better ride.



TODAY an improved ride is combined with improved handling. Most effective has been widening of lateral spring base, increasing tread width in front and mounting rear leaf springs outside of the frame rails. This change increases roll stiffness by as much as 20 per cent.

Until five years ago, suspension emphasis was on riding quality. Now attention has turned to improved roadability. The goal: "Sports car handling with a pillow-soft ride."

pension design and its effect on ride and handling. Furthermore they have had 20 years' experience producing and servicing independent drive wheel suspensions (both front and rear drive) that our engineers are still dreaming about.

But we haven't been standing still. Consider the evidence: Between the mid-'30s and the early '50s the bulk of U.S. suspension engineering was aimed at improving the *ride;* almost nothing was done to improve roadability and handling. The main weapons were softer springs and shocks, reduced friction between the leaves of a leaf spring, setting the engine farther forward to lower the pitch rate, and lower tire inflation pressures with wider tire sections. They did wonders. But the inattention to handling during those years resulted in cars that were downright *dangerous* when fitted with the new high-performing V8 engines. It was during this '49-'53 period that American cars got their reputation for poor roadability (a well-deserved reputation, incidentally).

Now, in the last five years, the slide-rule boys have started to think about handling —even learned to combine an improved ride with improved handling. There have been several very good weapons. Possibly the most effective has been the *widening* of the lateral spring base, by increasing tread width in front and mounting the rear leaf springs outside the frame rails. A four-inch increase in this crosswise distance between spring leverage points will increase roll stiffness some 20 per cent—*without any stiffening of the springs.* When you combine this with a lower center of gravity on the newer bodies you get a marked reduction of body roll on corners, less tire squeal, and more comfortable handling, without any sacrifice of riding qualities.

MUCH PROGRESS has been made in suspension *geometry,* too. In some cases front roll center has been raised well above ground level by minor changes in A-frame settings. At the rear the engineers have juggled shackle angles, spring lengths, and spring splay angles (the amount the spring points inward at front) to get precise control of rear-steering characteristics when the body rolls in a turn or crosswind. We've learned to use heavier anti-roll (stabilizer) bars in front. These gimmicks were practically untouched in 1950 . . . today the pre-setting of car handling characteristics on the drawing board is a bread-and-butter science in Detroit.

All of which brings us to the latest trend to new spring mediums. Packard started the ball rolling with their unique torsion bar setup on the '55 models. This project was an honest attempt to promote sales through advanced engineering; unfortunately they didn't have the body styling or advertising budget to make it stick. But it was, in fact, a brilliant suspension system—not because of the torsion bar springing itself, but because they achieved very desirable pitch characteristics by linking the wheel at one end of the car to act as the reaction point for road

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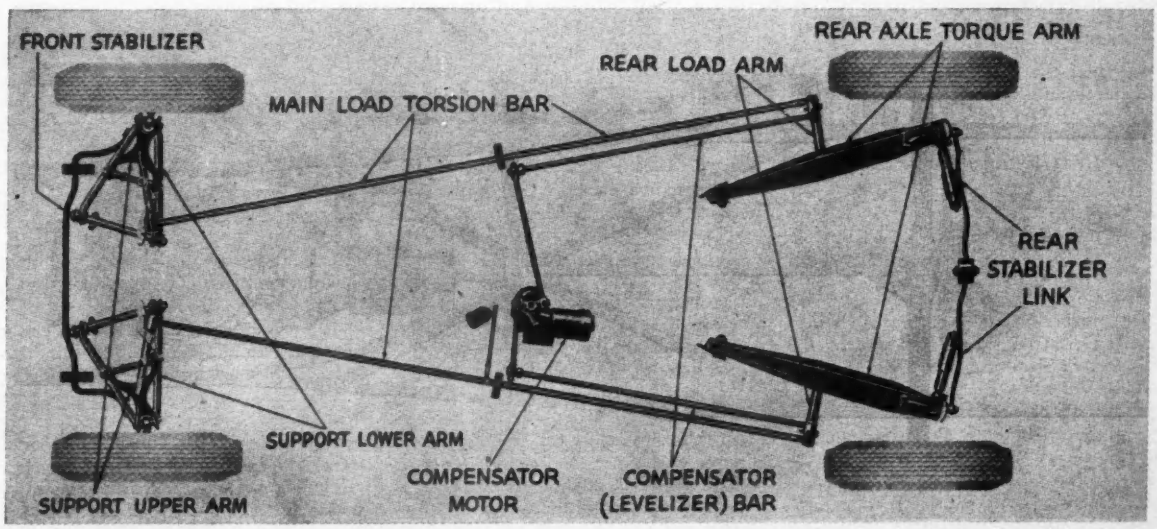
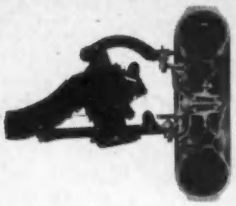
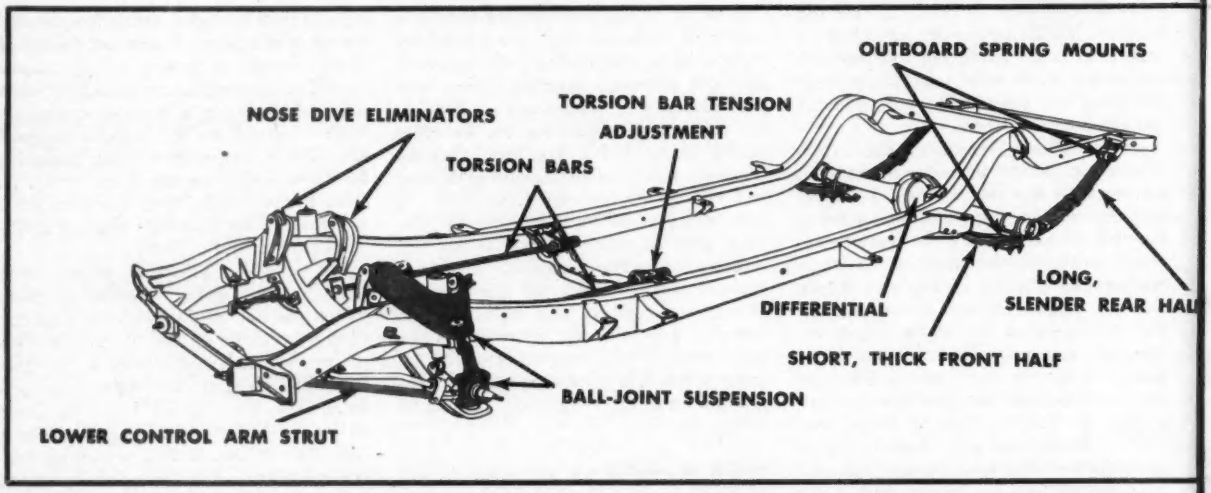


CAR-HANDLING CHARACTERISTICS was practically an untouched science in Detroit until 1950. Packard started the ball rolling with their unique torsion bar setup on the '55 models. They achieved desirable pitch characteristics by linking the wheel at one end of car to act as the reaction point for road bumps at the other end. It was a brilliant suspension system, but unfortunately they didn't have the body styling or advertising budget to make it stick. Regardless, car handling is new bread-and-butter science in Detroit. Suspension will improve.



Packard's torsion bar **suspension** started the ball rolling in '55; Chrysler's front torsion bar setup came in '57; today GM and Ford are turning to air springs.



CHRYSLER switched to torsion bar springs in front on their '57 cars, basically unchanged for their '58 models. Superior handling, however, can be attributed to the wide lateral spring base, low center of gravity, somewhat stiffer spring rates, high front roll center, good rear-steering geometry, and progressive valving in the front shock absorbers. "Torsion-Aire" ride helped to boost Chrysler sales, spurred development of air springs.

continued

bumps at the other end. We could see similar layouts again.

Chrysler Corp. switched to torsion bar springs in front on their all-new '57 cars, primarily to gain space in the engine compartment—and probably mostly as a sales gimmick. These cars are now, without doubt, the best-handling of all U.S. passenger cars. But let's get it straight right now that this is *not* a result of the torsion bar springs. The superior handling in this case can be attributed almost entirely to the wide lateral spring base, low center of gravity, somewhat stiffer spring rates, high front roll center, good rear-steering geometry, and progressive valving in the front shock absorbers. The cars would undoubtedly act just as nicely if converted to coil springs (other factors equal). The fact remains, however, that "Torsion-Aire" ride has had an unexpected impact on Chrysler sales . . . so much of an impact, in fact, that GM and Ford felt it necessary to answer with some radically-new suspension gadget on their '58 models.

This is how come air suspension. There is no doubt that, if Chrysler had not gone to torsion bars in '57, GM and Ford would not be offering air springs now. Automotive science may not be ready for them just yet. The air suspension engineering for current models has been rushed; lots of bugs remain. It will probably take a year just to get rid of these bugs—and about that time they may decide their whole basic layout is all wrong! "Crash" engineering programs are quite expensive luxuries.

One especially tough nut has been the conversion of existing Hotchkiss leaf spring rear suspensions to use air springs. As you know, an air spring unit is like a coil spring in that it has no inherent resistance to sidewise bending. A leaf spring *does* have this resistance, so it can act as its own wheel control linkage to resist axle torque and body sway. When you substitute air springs you must also provide an elaborate wheel control linkage to do this job. If this linkage isn't set up just right you can get into excessive cost, weight, road rumble, and weird rear-steering effects. In all cases of Hotchkiss conversions this year they use long trailing arms to absorb torque, with some sort of cross linkage to control body sway. Cadillac has converted their standard '58 rear suspension to coil springs, so they can use the same linkage setup for both air and steel springs (as Buick can do with its torque-tube rear end). The others convert the necessary parts on the assembly line.

The real answer, of course, is to design the chassis from the ground up for four-wheel coil or air springs—which is what they've done on the all-new Chevrolet, Pontiac and Lincoln. Then we have the necessary wheel control linkage engineered right into the overall chassis design, for minimum weight and cost, optimum insulation of road rumble, and best rear-steering geometry. Of course, the problems like compressors, leveling valves, plumbing and air tanks will have to be worked out as we go along. Production and servicing problems on these are an unknown factor right now.

No discussion of suspension trends would be complete without mention of the shock absorber problem. Shock absorbers should be seen and not felt, so to speak. Their sole purpose is to control wheel hop and body oscillation; any more "damping" force than is absolutely necessary to do these jobs just hurts the ride. In recent years Detroit has been learning how to use progressive valving to get more even shock action at low speeds on smooth boulevards and at higher speeds when the vertical wheel velocity is greater. Remarkable progress has been made. We're also making our shock units larger, so there is a greater volume of oil at work—and shock action doesn't suffer so much from heat build-up and foaming. We have manually adjusted shocks available; maybe soon we'll have automatic or dashboard ride control, like they did on luxury cars 25 years ago. And Lincoln's latest gimmick is to use "hydraulic lock" (trying to compress oil in a closed chamber) in their shocks to replace the effect of rubber bumpers on the suspension. There are lots of possibilities in shock absorber development yet.

SO WHAT OF THE FUTURE of U.S. passenger car suspension layouts? The ultimate goal in all this, of course, is to get sports car handling with a pillow-soft ride. It's not generally appreciated by auto enthusiasts, but a chief limiting factor in suspension development is the *tire*. We don't know how to make a tire that will give a very soft ride and yet will not flex and roll excessively under side forces.

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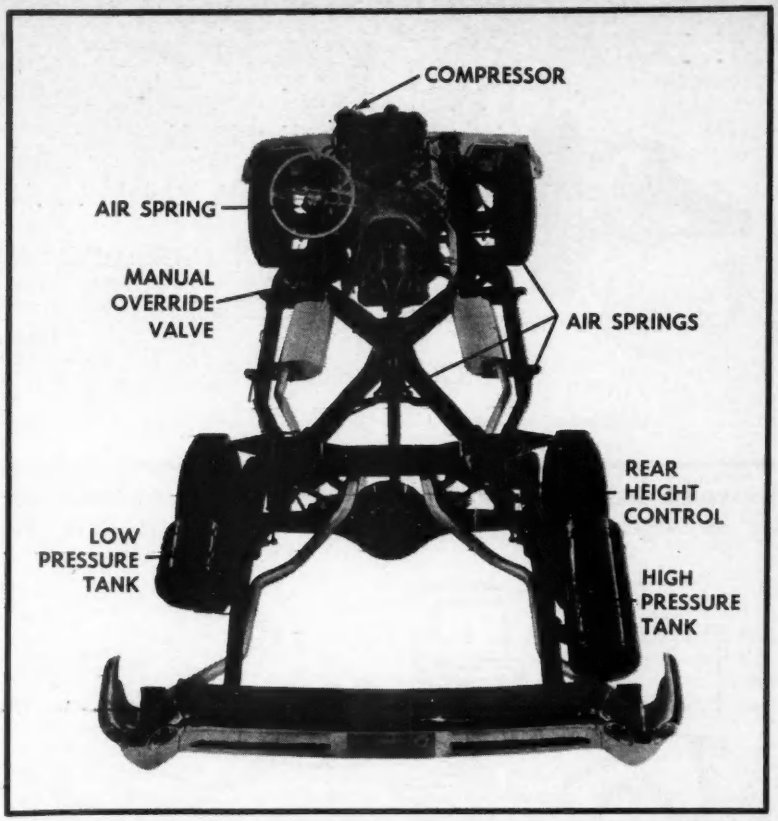
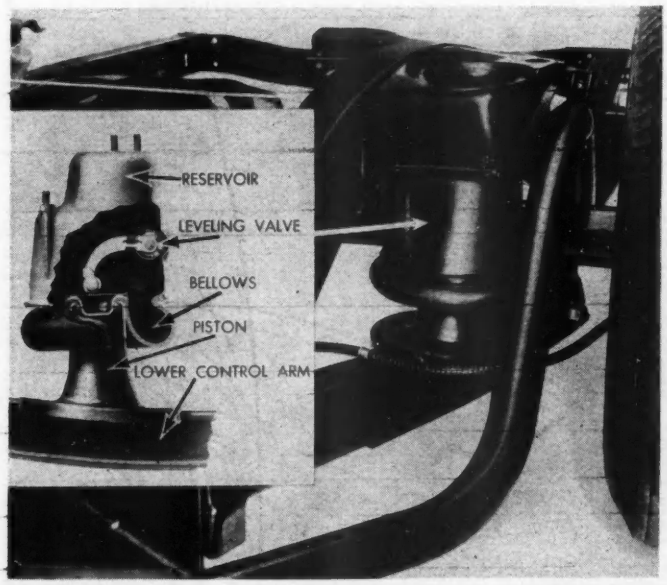
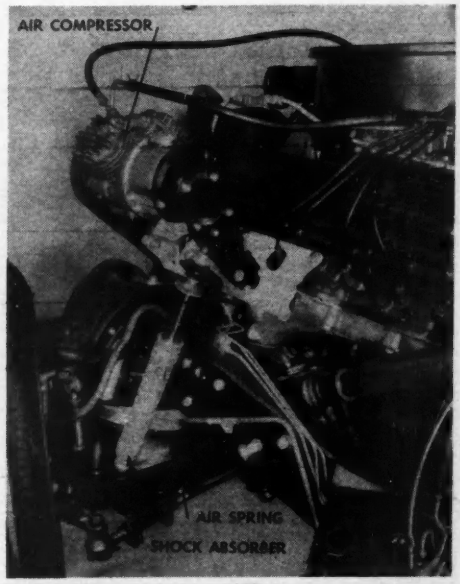


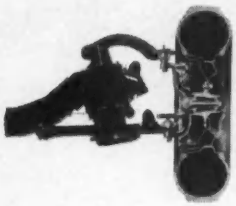
GM AND FORD both felt it necessary to come up with some radically new suspension on their '58 models in answer to Chrysler's torsion bar setup; this is how come air suspension. Above view of Oldsmobile's New-Matic system shows basic air components. Air spring-torsion bar battle continues.



INDIVIDUAL AIR SPRINGS, as in '58 Chevrolet's air suspension system, are mounted at each wheel. Leveling valve inside adjusts for load variations. Since an air spring has no inherent resistance to sidewise bending, wheel control linkage must be added.

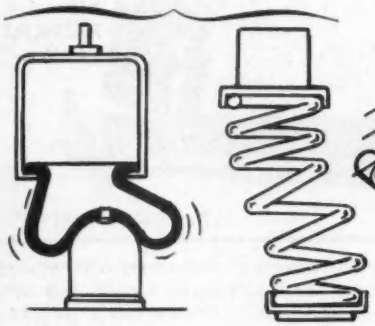


FRONT AIR SUSPENSION components on '58 Pontiac include air compressor run by pulley, and air spring at each front wheel. Shock absorbers are not eliminated with air system.

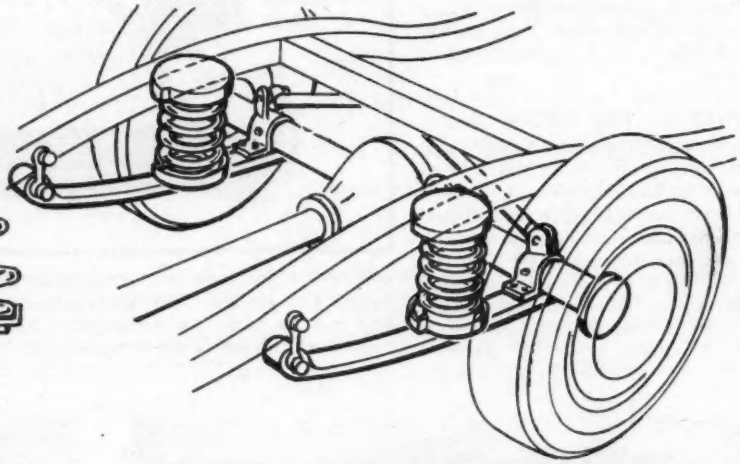


"Tires are the weakest link in the **suspension** chain . . . then there also is the matter of unsprung weight." Will the future bring a "practical gas-filled sealed spring"?

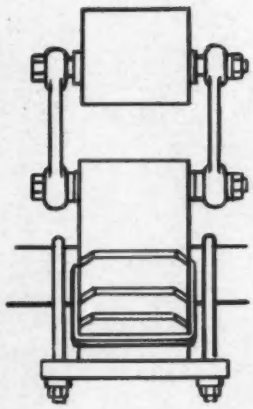
WHEN SPRING HAS NO INHERENT SIDEWISE STIFFNESS . . .



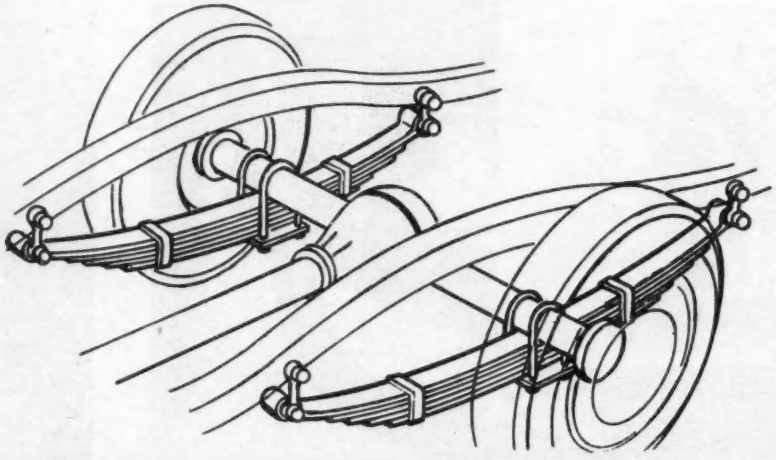
WHEEL MOVEMENT MUST BE CONTROLLED BY A STRONG LINKAGE

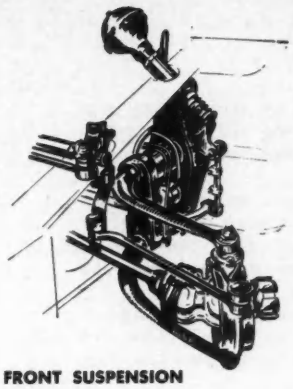


WHEN SPRING DOES HAVE SIDEWISE RIGIDITY . . .

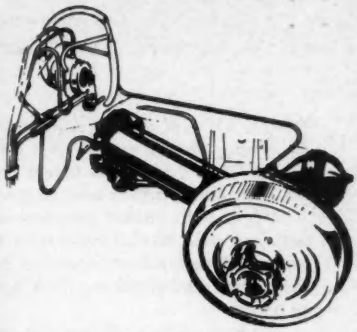


SPRING CAN ACT AS ITS OWN LINKAGE





FRONT SUSPENSION



REAR SUSPENSION

ONE EUROPEAN MANUFACTURER, Citroën, has come up with a completely different air-oil suspension system, front and rear. In addition, all four wheels are independently sprung and a manually-operated hydraulic levelling device raises or lowers the car to fit the particular type of road or situation. U.S. air suspension systems could very easily take on an adaptation of this seemingly practical air-oil layout in the near future.

continued

The best tire presently available from this standpoint is undoubtedly the French Michelin wire-cord type; but it's expensive, maybe a bit too noisy, and there is a certain harshness to the ride. The fact that tires are the weakest link in the suspension "chain" on American sedans is demonstrated by the terrific cornering shown by these cars in stock car road races at Elkhart Lake, Paramount Ranch, etc.—using big, hairy six-ply racing tires. This will be a major problem for engineers for years to come. Perhaps U.S. Rubber has the seeds of an answer in their new low-profile tire.

The other major area where U.S. suspensions fall down is on the matter of *unsprung weight.* The amount of road shock transmitted to the passenger compartment depends a lot on the ratio of sprung to unsprung weight (that is, the weight supported on the springs divided by the weight of tires, axles, brakes, etc., that move up and down with the road wheels). The greater the sprung weight in relation to unsprung weight the better the ride. Also, we don't have to compromise on spring and shock stiffness so much with low unsprung weight, so we can tune suspension for better handling on corners and rough roads. The answer, of course, is to throw out that big, heavy rear axle—mount the differential on the frame and use some form of independent rear suspension, with the wheels driven through U-jointed shafts. This will be the next major improvement on U.S. passenger car suspensions. You may see it in 1960, probably in conjunction with rear-mounted transmissions. Additional benefits of the arrangement will be a lower floor line (because the driveshaft won't be moving up and down), and a more even front and rear weight distribution. Four-wheel independent suspension could make a new car of that '62 Buick or DeSoto.

The battle between torsion bars and air springs will continue in the near future. The air springs will win out. In the last analysis these probably offer a better ride because of insulation of road rumble. Right now they're very attractive because of the constant body height feature, which allows a lower silhouette at the curb or with one or two passengers. Also, by careful design of the air spring itself the design engineer can pre-select the proper load-deflection curve that will give optimum ride and handling on his chassis. Many enthusiasts don't realize it, but these features are also available with *torsion bars!* Rotating the bar anchor block can vary body height, and smart use of shackle angles and rubber bumpers can give fairly tricky load-deflection curves. The torsion bar devotees will try everything before they give up. Look for Chrysler to come up with some cute gimmicks on their '59s.

And, of course, air suspension systems could take entirely new forms. The air-oil layout works well for Citroën in France, and would adapt itself beautifully to future central hydraulic systems. (This is the system used on the GM Firebird II show car.) We might eliminate the air compressor and use a storage tank that could be inflated at the filling station. Maybe someday we can come up with a practical gas-filled *sealed* spring; it won't have the variable-rate feature, but you could have a true air ride for one-tenth the cost of present systems. **/MT**

CHIEF LIMITING FACTOR in suspension improvement is developing a tire that will give a soft ride, yet not flex and roll excessively under side forces. Wire-cord type like French Michelin—though expensive—seems best approach.

***TOO OFTEN** when cars are compared, one suffers because the rule by which they are being measured is not the same. In the case of the Big Three cars of '58 road tested by MT this year, we have tried to apply the same measurements to each, but it is doubtful that all readers will agree with us.*

When you select one car of any one make as its representative you are subject to error, for any one car of any one make can at best be only the norm; others may be better or worse. Then when you try to compare three different cars against the other and derive from this conclusions that apply to all cars of each of those makes, you are on dangerous ground.

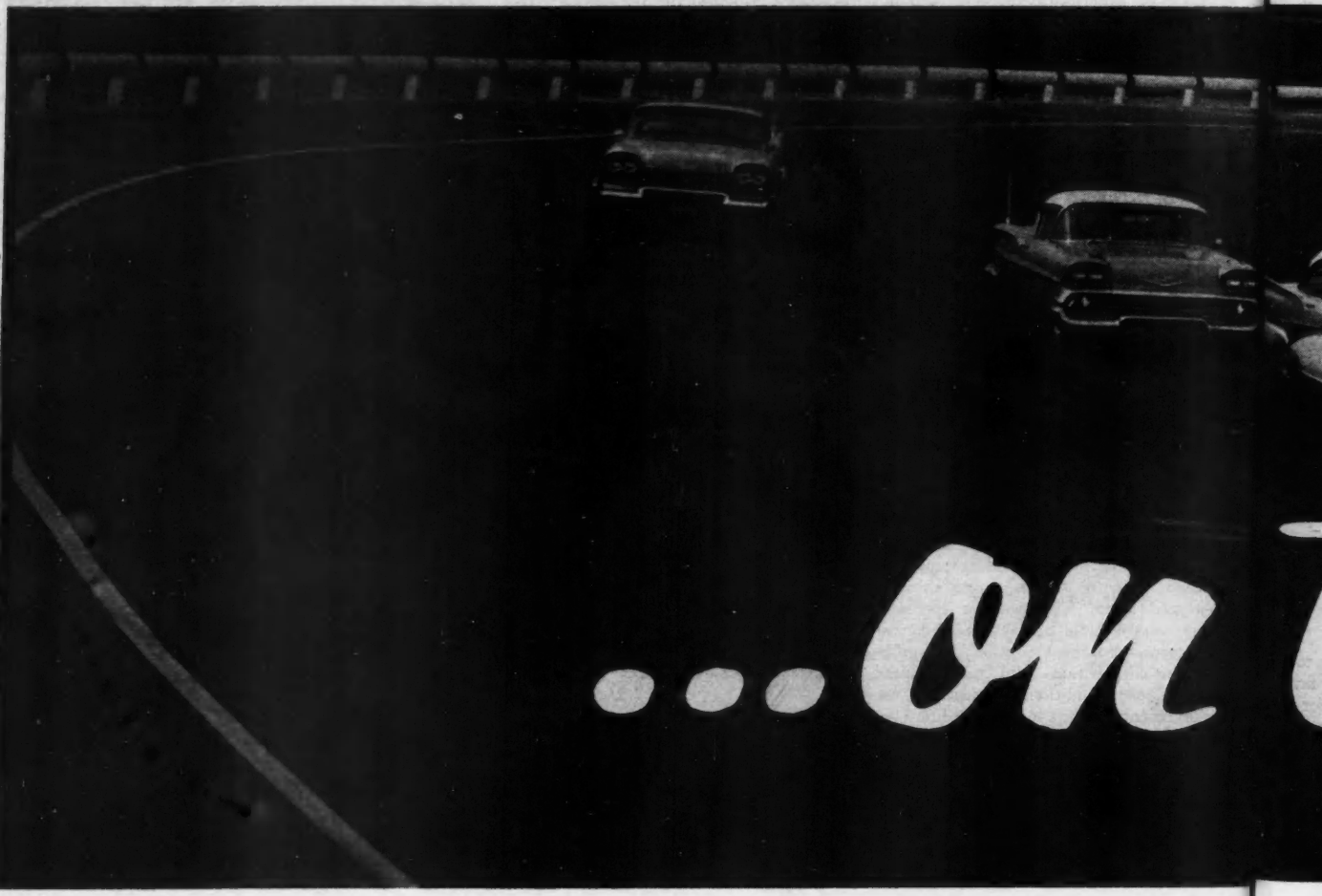
On top of this, three cars of different makes are no longer similar enough in all respects to make the comparison infallible. For example, though all three cars tested here are two-door hardtops on 118-inch chassis, and each has the top-available-horsepower engine, one has only (?) 280, another has 300, and the third has 305.

Though manifold other differences exist, these are the basic ones. Nevertheless, we feel that it is to your benefit to lay down comparisons between these three top-performing models of the three top-selling cars. It's up to you to draw your own conclusions.

—The Editors

PLYMOUTH...

TOP MODELS OF THE POPULAR BIG THREE DRIFT AROUND ONE OF THE SWEEPING TURNS AT RIVERSIDE (CALIF.) INTERNATIONAL



CHEVROLET The pattern of the Detroit sell process sometimes evidences itself in the name first applied to a show model: the show model disappears and the name reappears later on a production model. This is the case of the Chevrolet Impala—a fast, maneuverable, personal sport coupe that seems to possess all the attributes of the European Gran Turismo car. As an addition to the Bel Air line, it has much in common with its less speedy partner, but like a good drink, it's sometimes not so much the ingredients as the combination that counts.

FORD Unfortunately, production was at a low level when we picked up our Fairlane 500 fresh off the line in Detroit. We did, however, put on a good 712 miles in Michigan and on the Ford Motor Co. Proving Ground, which was enough to tell us that Chevrolet is going to have trouble in this newly developing "Gran Turismo" (grand touring) class of Detroit machinery.

PLYMOUTH The Fury is Plymouth's attempt to effect a compromise between a sports-type car and a family automobile. The '58 version is a great improvement over the '57, for with the new Golden Commando engine, performance is terrific. Construction, assembly and finish are also greatly improved. It is truly a high-performance, safe, sports-type family car that should not only hold its own at the dragstrip, but is also well suited for city and highway driving.

Q. What type of car was tested?

CHEVROLET Two-door hardtop in the Bel Air series, with largest engine in line—new 348-cubic-inch V8, rated at 280 hp at 4800 rpm. Had three dual-throat carburetors with progressive-type linkage, and dual exhausts. Had 9.5 to 1 heads, Turboglide two-speed transmission with "grade" gear, and rear axle ratio of 3.55 to 1. Only extras were radio and heater.

FORD Two-door hardtop in Fairlane Series, with largest engine in line, 352-cubic-inch V8 rated at 300 hp. Had one four-barrel carburetor, 10.2 to 1 heads. Driveline was Cruise-O-Matic three-speed transmission, rear axle ratio of 2.91 to 1. Extras included power steering, power brakes, power windows, seat belts, radio and heater.

PLYMOUTH Two-door hardtop in Belvedere series, with largest engine in line—new 350-cubic-inch V8, rated at 305 hp at 5000 rpm. Had two four-barrel carburetors, dual-breaker distributor, dual exhausts, 10 to 1 compression heads. Driveline was TorqueFlite, three-speed pushbutton transmission, rear axle ratio of 3.31 to 1 (not Sure-Grip). Suspension different from stock in larger front torsion bars, six-leaf rear springs instead of five-leaf as on other V8s. Extras included power steering, power brakes, radio, and heater.

continued

CHEVROLET... FORD...

RACEWAY WHERE MT WILL DRIVE ALL 1958 CARS ON THE TURN-FILLED COURSE UNDER IDEAL, CONTROLLED TESTING CONDITIONS

CHEVROLET — the car to

THE FIRST FEEL

Q. Is exit or entry convenient, or difficult?

CHEVROLET The front seat is well placed in relation to the door opening, though the clearance between the seat and wheel is slight enough to cause you to slide under it. If you're around 5'10" you'll consciously avoid the wrap-around with your left knee until you get used to it. You'll also avoid the roof. Entry to the rear seat is awkward because of the lack of room between the rear of the front seat and the door opening.

FORD No particular inconveniences about wrap-around noted; seat belt was bothersome upon getting out, for left half always fell to doorsill and then had to be laid on seat. Entry to rear seat somewhat awkward because of limited space between back of front seat and rear of door opening.

PLYMOUTH The slantback windshield post makes entry into the Fury easy without fear of banging your knee. A movement that later becomes an unconscious one is the avoidance of the top of the door opening with your head. Entry to the rear seat is also difficult because of the low roof.

Q. Are instruments and controls convenient?

CHEVROLET Instruments and controls are well placed and adequately lighted. It is a relief to find an instrument panel laid out for the driver's convenience. Everything, including ashtray, radio controls, and glove box is within arm's reach.

FORD Instruments all easy to read, except rheostat dimmer for all instruments also dimmed clock light, making it hard to see. Instrument lights also reflected in left vent window and in left door window, though there were no reflections in the windshield. The glove box is too far right to be convenient to driver; it also had no light.

PLYMOUTH All instruments are easy to read both day and night. Controls are easy to reach, except for the cigarette lighter. The glove compartment is too far to the right to be convenient to the driver; it used to be in the middle—why did they change? Foot-operated fresh-air vent control under cowl was awkward to use.

Q. Does it start quickly?

CHEVROLET Starts, whether hot or cold, were generally of the instantaneous variety. There was no evidence of early morning reluctance; the engine would start and run reliably and quietly from cold. The ignition switch location could be improved; at present the gearshift quadrant when in neutral position makes it hard to insert the key.

FORD Ignition key on left still causes us to fumble from right hand to left hand after unlocking the driver's door; the lack of a light in the keyway was bothersome at night. Starts were quick when engine was cold, but hesitated for several cranks when it was warm. Starting noise and engine idle sounds were somewhat louder than other V8s.

PLYMOUTH Starting was instantaneous on hot starts, but some trouble was encountered on cold starts. The engine ran quietly and warmed up *very* quickly.

DRIVING IN TOWN

Q. Is driving position comfortable?

CHEVROLET The steering column is almost horizontal and the wheel position is of the arms-almost-straightforward type that inspires confidence in the driver. The seat is firm, comfortable, and adjustable fore and aft on the driver's side only. Unlike some other cars, seatback does not rake back at an awkward angle when it's moved to its rearward position.

FORD Driving position is quite good, though some will prefer more legroom. A complaint common to many other '58s is the thin-rimmed steering wheel. The seat-to-wheel relationship is fair, though a 5'2" femme felt she was too close to the wheel when she adjusted the four-way power seat to where she could reach the pedals.

PLYMOUTH The location of the steering wheel and the armrest is good. The wheel does not interfere with visibility of the instruments or of the road. The seat cushion is not the most comfortable after a few hours of driving because it's not thick enough. A long-legged driver will suffer a fatigued right leg after prolonged driving due to the lack of support under the thigh; a rolled pleat on the front edge would help, and a throttle suspended from the top instead of from the bottom would increase legroom.

Q. What is general feel in traffic?

CHEVROLET The steering, not power assisted and with too many (five) turns, but with a short turning radius, seemed at first to be impossibly heavy. A quick stop at the wheel aligners for a minor adjustment and increase in tire pressure from 26 to 32 psi effected a miraculous change in ease of handling. Parking, however, on a highly cambered street could be considered heavy without the assistance of power steering. Maneuverability is quite excellent and judgment of parking spots is easy because of the good vision and little overhang. No dragging on driveway ramps was encountered. The door height is sufficient to clear most curbs,

capture those interested in an American Gran Turismo

but the chrome rub rail under the door takes a beating unless the curb is very low.

The absence of pitch under traffic braking—mark one up for the new suspension—and the progressive characteristic of the transmission that does not snatch gear changes offers a cross-town ride that once was the exclusive property of chauffeur-driven gray-haired ladies. The fairly high-geared steering allows the driver to take full advantage of these properties with a high degree of safety.

FORD Steering is light, yet retains a fair feel of road irregularities. It's easy to park, though it takes too much time to turn the car through its 4½ turns lock-to-lock. Getting it up against a particularly high curbing, you're liable to scrape the rocker panels, but it's better that you do that instead of scraping the side of the car. Average driveway ramps won't cause you to drag unless, as with almost all cars today, you have on a heavy Continental kit.

The Fairlane 500 is quite agile in traffic, considering its overall length. Streetcar tracks caused only a slight pull to one side that was easily corrected—almost without notice. The overall acceleration and braking feel is good except for the dive on braking—this could stand improvement, for it felt to us that there was more than on comparable '56 and '57 models.

PLYMOUTH Steering ease with the power assist and only 3½ turns lock-to-lock is as effortless as touted by Plymouth ad copywriters. Parking is simple, with the rear fin offering a good guide. High curbs interfere with the doors. The large turning radius (45 feet) caused some trouble in parking lots. Though the Plymouth has considerable overhang, at no time did it hang up on any driveway.

In traffic, the Plymouth is quite agile. The wide cross-section tires cause the car to be pulled aside by streetcar tracks and road edges, but it is easy to recover. The lowness of the car is one drawback in that it makes visibility through the car ahead difficult unless it is also a late-model Chrysler product. You'll have to take it easy on the throttle foot to hold the car back, but when you brake, you'll note an absence of front-end dip.

Q. How is vision?

CHEVROLET Visibility is excellent. The windshield rake is such that intersection approaches are never blinded. The location of the auxiliary mirror on the driver's door offered a rearward look that included part of the left rear fender, which proved invaluable on freeways where another car is often on your left fender. The location of the inside rear view mirror could be improved or should have some means of adjusting to various heights. Windshield wipers offered the usual coverage of the windshield with unswept spots at the top center, left, and right sides—a complaint common to wrap-arounds.

FORD Vision in traffic is good all around. There is slight windshield distortion at the extreme lower corners, but it's too low to be of any bother. Mirror-wise the Ford could stand improvement: the inside rear view one is too narrow and the outside one is too far back. The windshield wipers are quiet, give better-than-average coverage, and don't even skip the glass at high speeds as do some others.

PLYMOUTH Vision through the front windshield is good for city driving, though some distortion is still evident at the extreme ends. The new location of the inside rear view mirror (closer to the driver) gives improved rear vision; its width, encompassing the entire rear window, is also commendable. Outside rear view mirrors are too far from the driver for the adjustment they constantly need to be of much use. There are few blind spots in the entire 360-degree circle. The electric wipers offer better-than-average coverage of the windshield.

Q. How do the brakes feel?

CHEVROLET The brakes on the Impala, not power-assisted, are pleasantly progressive. Pedal pressure necessary to operate them could be called medium. The location of the pedal makes either right- or left-foot operation a simple matter. The emergency brake operates with a foot pedal on two rear brakes and

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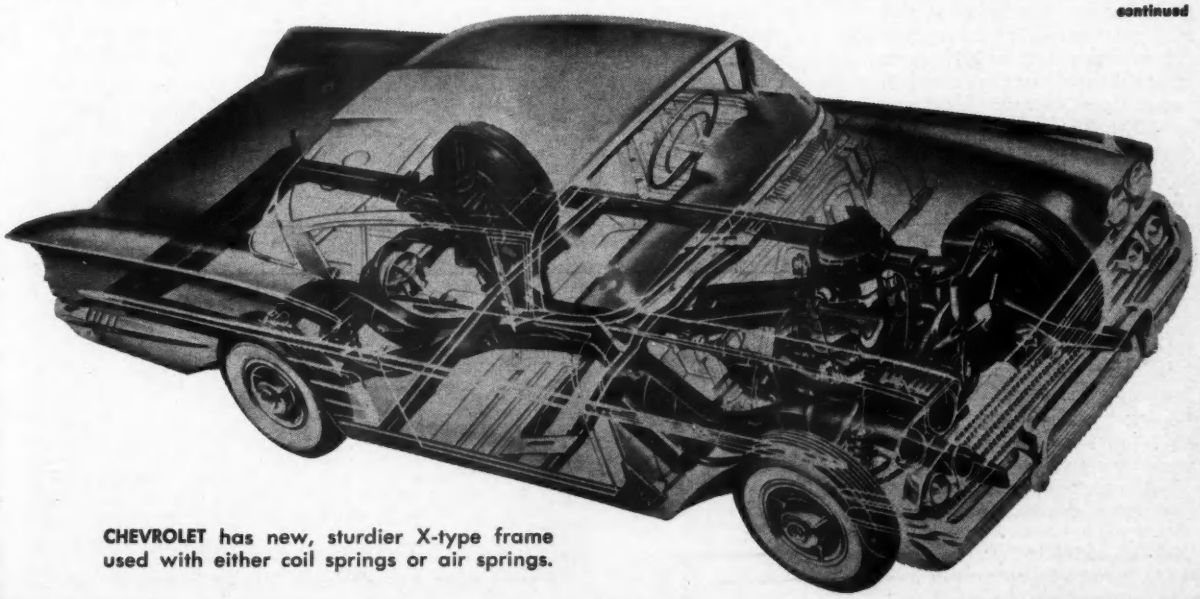


CHEVROLET has new, sturdier X-type frame used with either coil springs or air springs.

FORD — a proven car with bet

can be used for emergency operation. Such a stop can be made in about 2½ times the normal distance with the foot brake; caution is necessary on loose or slippery surfaces to prevent accidental locking of the rear wheels. The emergency brake quickly releases with a fingertip control.

FORD The power brakes of the 500 have a moderate pedal and never once grabbed under normal usage. Keeping a foot on the pedal going through rain puddles prevented them from grabbing even then. The pedal is positioned for good heel-and-toe action. An emergency stop on dry pavement at 30 mph using the emergency brake halted the car in 40 feet.

PLYMOUTH For power-assisted brakes, those on the Fury were not too sensitive, nor too hard, eliminating the tendency to grab at slow speeds. The relationship of the throttle to the brake is excellent for heel-and-toe driving. Left-foot braking would also be easy, though experience has taught us that this causes too much unintentional dragging of the brakes. An emergency stop using the T-handle emergency control operating on the driveshaft was fairly quick, without loss of control.

Q. How is the transmission?

CHEVROLET The Turboglide transmission of the Impala is an improved version of the Powerglide, with a lower gear for starting, pulling, or slowing you down on grades. It is not advisable to use this gear (GR on the quadrant) for fast takeoffs because the action in the torque converter at this time is the creation of a turbulence in the oil to impart a drag on the rear wheels. Accidental usage of this gear for fast takeoffs will result in a sudden lurch when shifting and possible damage to the transmission or driveline.

The proximity of DRIVE (D) and REVERSE (R) on the quadrant is desirable for rocking out of sand or snow. In practice, however, some fairly frightening noises emit from the drive train. This is probably the result of backlash and could become worse with wear. In normal operation the Turboglide is unusually quiet and free of harshness.

FORD The Cruise-O-Matic automatic transmission is an improvement over Fordomatic in that with it you have a better selection of gears. With the gearshift quadrant in D-2, you always start in second gear; in D-1, you start in first gear. For extreme grade pulling or extra fast takeoffs in which you want to rev the engine higher than the transmission ordinarily allows, you can use LOW. When you start in LOW, however, the transmission stays in low gear and will *not* upshift until you manually move the lever. Upshifts and downshifts are ordinarily smooth; it's only when you're under full load that you get a lurching motion during shifting. You can use the transmission for slowing down by dropping down a gear or two. For example, we levered down to LOW at an indicated 80 mph. After about two seconds, the box shifted to second gear, then dropped to first at around 25 mph.

PLYMOUTH The three-speed TorqueFlite transmission is "finger-tip operated" with your left hand; despite the fact that this gets it out of the reach of tiny tots' mischievous fingers, it's more awkward to use than a lever you can reach without removing your hand from the steering wheel. Of course, the only time you need use the controls is when you want to use engine braking for slowdown and you punch the 2 button, or when you are backing in and out of a parking spot. The fact that they're mechanically operated is a distinct advantage over electrically-operated controls such as on the Edsel. Gearshifts both up and down can be felt, but are not annoying except under extreme acceleration or deceleration conditions.

AT THE DRAGSTRIP

Q. How does it go?

CHEVROLET The Impala betters last year's test car, a 270-hp Bel Air four-door hardtop, by a considerable margin in most categories. With a Powerglide transmission that could utilize the advantage of a low-gear start instead of the second-gear start necessary with Turboglide, the times could have been improved. The fact that the car was equipped with Positraction, Chevy's version of a limited-slip differential, made it difficult to provoke wheelspin. Therefore, to get the best possible times all that was necessary was to rev up the engine, hold a foot on the brake, then simultaneously mash the throttle and release the brake. Here's how the average times compared to the '57 Chevy:

'57 with 270-bhp engine	'58 with 280-bhp engine
From Standing Start	
0-45 mph 6.8 0-60 mph 9.9	0-45 mph 6.4 0-60 mph 9.1
Quarter-mile 17.5 and 77.5 mph	Quarter-mile 16.5 and 83.5 mph
Passing Speeds	
30-50 mph 3.6 45-60 mph 2.9	30-50 mph 3.6 45-60 mph 3.2
50-80 mph 9.9	50-80 mph 8.0

FORD There's no question about this 300-bhp Ford Fairlane 500 outperforming last year's 500 counterpart—with 55 more horses under its hood it should. The '58 lays rubber easily if it's punched hard on the start in either D-1 or LOW. In fact, you can even provoke wheelspin with a conventional rear axle on slow corners in town if you're too lead-footed. Maximum acceleration was gained by making all starts from standstill in D-1 (which starts you in first gear); D-2 was used for all passing speed runs. There was a slight flat spot noticed in the engine around 80 to 90 mph, then it picks up again. In times, here's how the '58 compares to the '57:

'57 with 245-bhp engine	'58 with 300-bhp engine
From Standing Start	
0-45 mph 6.9 0-60 mph 11.1	0-45 mph 6.5 0-60 mph 10.2
Quarter-mile 18.2 and 77 mph	Half-mile 104.0 mph*
Passing Speeds	
30-50 mph 4.3 45-60 mph 4.3	30-50 mph 4.2 45-60 mph 4.7
50-80 mph 12.4	50-80 mph 11.3

*Quarter-mile time not available; this figure will be published later

PLYMOUTH This year's Fury is really blowing up a storm, bettering the performance of all Plymouths tested by MT last year; this it should do with a 305-bhp engine. On the smooth blacktop surface of the San Fernando dragstrip, it was hard to keep from laying a black strip of rubber with the driving wheel. The use of the Sure-Grip differential and a 3.73 gear would be advisable for steady dragstrip operation, though highway driving and gas mileage would suffer. Maximum acceleration was obtained by starting with the transmission in low gear (1), and shifting to second gear (2) at 45-50 mph. The transmission completed its shift to third automatically at about 60 mph. There was no valve float or clatter, though a slight flat spot was noted at the beginning of acceleration—around 15-20 mph. Here's how the times compare to our test car of '57, a Belvedere four-door sedan with 235-bhp engine:

'57 with 235-bhp engine	'58 with 305-bhp engine
From Standing Start	
0-45 mph 6.7 0-60 mph 10.7	0-45 mph 5.2 0-60 mph 7.7
Quarter-mile 17.9 and 77 mph	Quarter-mile 16.1 and 86.5 mph
Passing Speeds	
30-50 mph 4.2 45-60 mph 4.2	30-50 mph 2.9 45-60 mph 2.6
50-80 mph 11.5	50-80 mph 7.2

(Editor's note: And *who's* not in *what* horsepower race?!)

ith better handling, a good ride, and snappier performance

USING IT FOR TRIPS

Q. What kind of ride does it have?

CHEVROLET The ride could be classed as medium hard, but the car has very little body roll. Road noise is of a very low level. On trips up to 200 miles, front seat comfort was good. The lack of legroom in the rear seat is not conducive to comfort for rear seat passengers.

FORD The ride is fairly soft and so on hard corners, body lean is considerable, though the use of seat belts minimized this feel to the driver. It's a comfortable, durable, long-trip car. The front seat was very comfortable, and the rear seat has been improved, though it's still not up to the standard of the front seat. Most road noises were not imparted to driver or passengers because the test car was undercoated, well assembled, and tight.

PLYMOUTH The ride is firm, with roll being noticeable to passengers, though overall it could be classed as good for long trips. Seat comfort is fair except in the center of both front and rear seats where the padding is entirely inadequate. Rear seat passengers complain about lack of legroom. The stiff suspension, though it imparts a feeling of security to the driver, transmits annoying sounds from road cracks, small bumps and holes.

Q. Is it tiring to drive?

CHEVROLET Although a certain amount of road "feel" gets through to the driver, fatigue-provoking vibration of the steering wheel or column is very low. One complaint about distance driving can be leveled at the spoke layout of the wheel. The two spokes are located in such a way that they cannot be used as a relief from the normal rim position of the hands when a slightly different grip on the wheel would be restful.

FORD There is only a slight vibration in the steering wheel—hardly enough to bother mentioning. If you're used to a straight-out arm position, holding on to the Ford's wheel may become a bit tiring for long stretches.

PLYMOUTH There is very little vibration in the wheel or column. When you get tired of holding both hands on the wheel, you'll find that if you want to rest your left arm on the windowsill it's quite high to be too comfortable.

Q. How is it on rough roads?

CHEVROLET The Impala's firm suspension, surprisingly enough, makes light work of rough roads or those with loose surfaces. Dips can be negotiated without wallowing, bottoming, or swerving. Positraction, smooth throttle response, and a sensible weight distribution give the Impala a high degree of controllability on surfaces that would ordinarily be treacherous.

FORD On moderate washboard roads the test car did not feel skittish, but on loose dirt and gravel, it had a tendency to waltz—the degree depending on the speed and whether or not the road had a high camber. A non-slip rear axle and a bit more tail-end weight would help. Dips and bumps would cause wallowing only if taken at foolish speeds; the same is true of railroad crossings. The car could be made to bottom, but not as easily as previous models. Deep chuckholes will cause the affected wheel to "talk back" through the steering gear, but correction is easy.

PLYMOUTH The stiff suspension of the Fury does not give a pleasant ride on rough roads. It has fine control on loose dirt and gravel. There is no bottoming on sharp dips taken at average speeds, though there is some at higher-speeds. The Fury does not wallow coming out of dips.

Q. Is luggage space adequate?

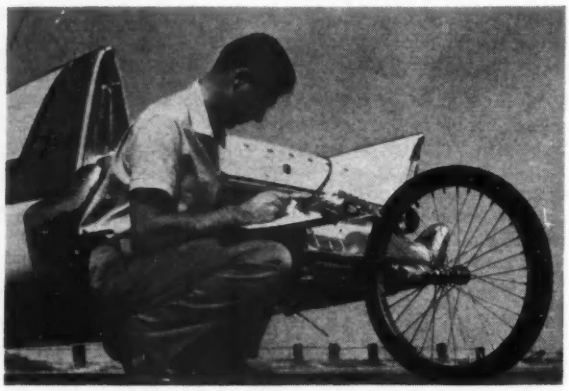
CHEVROLET The trunk is large with a fairly low entry. Whether the trunk is loaded or empty the spare is readily accessible because of its stand-up position on the curbside near the rear.

continued

PRACTICE FORD is photographed at Riverside International Raceway for appearance on General Petroleum TV show.

FORD The luggage space is excellent and is more than is generally needed. It's easy to load and the stand-up spare and jack are easily reached. No problems would be encountered on this score, though long arms will help.

PLYMOUTH Luggage space is quite adequate and though there is a sill, loading or unloading is not too difficult. The spare would be difficult to remove for a woman, for she would have to first lift it from its flat position before it could be rolled or lifted out.



Q. Is there much wind noise or any air leaks?

CHEVROLET Doors and windows are draft-free. Wind noise was always present with partially opened windows. Although it was possible to vary the intensity and level of the noise by adjustment of the windows, it seemed impossible to eliminate the wind noise entirely. One particularly irritating draft that was capable of turning the driver's right foot to a lump of ice was caused by poor valving in the air vent system—it directed a cold stream of air on the throttle foot.

FORD Any speed above 40 mph with the wind vents open produced annoying wind whistles, varying with the speed. Ventilation was therefore obtained with the right front window cracked open from two to four inches. All doors, weatherstripping, and seals were properly tight. There were no serious drafts under cruising conditions. Through bucketsful of rain no leaks became apparent.

PLYMOUTH Wind noise was not excessive or irritating under any conditions of windows open or partially open. With all windows closed no air leaks were evident.

Q. How is the heat and vent system?

CHEVROLET The temperature controls are conveniently located and adequately lighted. Blower noise is not obtrusive. Heating is satisfactory and available almost immediately upon starting—even from cold engine condition.

FORD The heater controls take an average stretch of the arm. They're lit for night operation and dim with the panel light rheostat. They are easy to operate, but getting the exact amount of heat wanted was a bit difficult. The use of the blower was not required down to a temperature of 45° F; when it was used it was more quiet than average. The defroster worked very good, giving a fairly wide spread on the windshield.

PLYMOUTH The heater control is easily operated. The fresh air vent is located under the cowl and is foot-operated. The blower is not noisy and in conjunction with the heater supplies plenty of heat. The defrosters are quite adequate. There are, however, no lights to make night operation of the controls easier.

Q. What is it like to drive on straight roads?

CHEVROLET The car at all times proved to be commendably stable. The steering is positive at all speeds and at normal speeds variations in wind intensity had little effect. Even at speeds in the vicinity of 100 mph there was no inclination to wander. At no time did it feel unsafe solely because of high speed. At low speeds, road camber had little effect.

FORD The road feel at all times is unusually good for a power-steered car. Corrective action on straight roads is not often required, for the car tracks well. Our standard test of whipping the wheel to one side and noting its straightline recovery proved this. The steering can be considered slow, but light. Wind gusts affect the steering only moderately, even in extreme side gusts. The car feels safe up to speeds of 90 mph, but at higher speeds the tail end gets light, then the front end.

PLYMOUTH Very little corrective action is required to keep the Fury on a straight line, though the steering is not positive enough for such a fast car. It has a very light feeling and is affected by wind gusts. Its straightline recovery is not satisfactory in that it does not return to a straight course if the wheel is tugged to one side; crown roads tend to pull it to the lower side. It does, however, feel safe at average highway speeds.

Q. What happens in turns?

CHEVROLET Through gentle radius turns at average speeds the steering of the car is absolutely neutral with little inclination by the front wheels to return to a straight-ahead position. At faster speeds in gentle turns it is possible to set up and maintain a soft, unresponsive drift. At high speeds through sharp turns understeer, with lack of response to the angle of the front wheels in relation to the road, becomes a problem. The front end becomes heavy, noses down at a steep angle and then pushes the front wheels toward the outside of the turn. Here engine torque and a limited-slip differential can be used to advantage. By careful use of the throttle, rear wheel adhesion can be lowered by breaking the rear wheels loose, allowing centrifugal force to carry the rear end out toward the outside of the turn. By this method of rear end steering it is possible to get out of trouble, but under normal conditions the car behaves and is quite stable.

FORD The 500 stays put with moderate lean in gentle turns at average speeds, while at a faster clip there is considerable lean. This is where the driver is happy to have a moderate amount of understeer. In sharp turns, an unladen 500 tends to get a bit light in the rear and if it's pushed faster it will break loose—but only after fair warning. At this time the front end also tends to get heavy and there is liable to be some wheel fight, though the combination of power steering, the use of LOW gear, and a generous use of the throttle make for easy correction. Through a long curve, it is possible to drift the car through. Most generally, if the car is pushed hard it will slide before drifting. After coming out of a turn the wheel centers itself nicely. If the car is given its head at this time, it will tend to

straighten itself out without the need for frantic unwinding. On slick surfaces the rear end easily becomes unstuck and the front end becomes heavy more quickly.

PLYMOUTH Through gentle radius turns at average speeds the feel is excellent with practically no lean. Taking the Fury on up to much faster speeds you still have a feeling of control. Rubber bumpers on the suspension limit the amount of wheel travel and as a result the car sets quickly in turns, with an apparently small amount of lean. The front end tends to get somewhat heavy in hard turns, but there is no wheel fight. The wheel does not return to a dead ahead position. With full power on, a four-wheel drift can easily be induced; otherwise the back end can be made to come around. In both situations, there is a feeling of mastery over the car.

Q. How are the brakes?

CHEVROLET Braking is even on all four wheels under most conditions; however, fade is a real problem—as with all manufacturers. One crash stop from over 100 mph will render the brakes inoperative until they have cooled. Two successive stops from a corrected 80 mph also finds the pedal on the floor. Although in normal use the brakes are adequate and reliable, it isn't being unduly critical to question a manufacturer who builds a car capable of speeds over 100 mph that will not stop on demand.

FORD Normally, no ill effects were encountered with the 500's brakes, though brake dive seemed excessive. Under hard usage it took six hard stops from 60 mph down to 20 mph to induce fade, and by the ninth stop the pedal was hard enough to constitute a dangerous condition. The brakes recovered after a couple minutes of running at highway speeds. Though there was no serious swerving, these brakes are no improvement over last year's car, which they certainly should be with more horsepower.

PLYMOUTH Under normal usage, no ill effects were found in the Fury's brakes. After five or six quick slow-downs, from 60 mph down to 20 mph, the first sign of fade was encountered and there was a slight pull to one side. After allowing a few minutes for the brakes to cool full stopping ability was again achieved. This is hardly adequate, however, for a car capable of speeds well over 100 mph.

Q. How well does it climb hills? Descend them?

CHEVROLET The V8 engine has a surplus of torque that will handle any grade. Turboglide also offers a certain amount of engine braking that is indeed welcome, since the threat of brake fade is always present.

FORD The Fairlane 500 should be able to handle the steepest grade with no difficulty. Unfortunately, there is too little engine braking with the Cruise-O-Matic transmission. You can drop the lever into LOW, but in either D-2 or D-1 you virtually "coast" in third gear.

continued

THE 305 HORSEPOWER of the new Golden Commando engine is better harnessed by a limited-slip differential, as indicated here by the twin tire marks of the Fury on right, in contrast to the single tire mark of Fury on the left.

PLYMOUTH The power of the Fury is adequate for the steepest hill in the country. For engine braking downhill second gear (2 on the pushbutton of TorqueFlite) is quite adequate. For the steepest grades, low gear can be used.

FUEL ECONOMY

CHEVROLET The sad part about all U.S. high-powered cars is that fuel economy is no longer a part of the scene; fuel consumption would be a better phrase. Take a look at how the Impala compares against the 270-bhp Bel Air tested last year:

'57 Bel Air	'58 Bel Air Impala
Stop-and-Go Driving	
13.6 mpg for 136 miles	12.7 mpg for 260 miles
Highway Average	
15.0 mpg for 312 miles	14.6 mpg for 803 miles
Overall Average	
14.5 mpg for 448 miles	14.2 mpg for 1063 miles
Fuel used: Mobilgas Special	
Oil Consumption	
One quart added in 974 miles	One quart added in 1063 miles

FORD Comparing the '58 Fairlane 500 to the '57 makes you wonder if the power is any *real* gain. As a couple of service station attendants noted, "This economy pitch is eye-wash," and "Bet it eats gas like a bus." Here's the sad story of how much gas such a powerhouse uses:

'57 Ford Fairlane	'58 Ford Fairlane 500
Stop-and-Go Driving	
*	10.3 mpg for 215 miles
Highway Average	
*	13.4 mpg for 497 miles
Overall Average	
15.6 mpg for 569 miles	12.5 mpg for 712 miles
Fuel used: Mobilgas Special	
Oil Consumption	
Two quarts in 569 miles	None in 712 miles

*All mileage shown together in overall average.

PLYMOUTH The sacrifice you must make to get and use much power is in proportion to the amount you lay out for gasoline; for a Plymouth Fury, the price is quite high. Here's how the '58 compares to the 235-bhp Belvedere tested in '57:

'57 Belvedere	'58 Fury
Stop-and-Go Driving	
12.0 mpg for 80 miles	8.4 mpg for 133 miles
Highway Average	
15.0 mpg for 806 miles	10.6 mpg for 315 miles
Overall Average	
14.7 mpg for 886 miles	10.0 mpg for 448 miles
Fuel used: Mobilgas Special	
Oil Consumption	
No oil added in 886 miles	One quart added in 448 miles

SERVICING

Q. How is it to service?

CHEVROLET The gas filler cap is conveniently located in the center and can be filled rapidly. The oil filler neck is located well, as is the battery for quick servicing. Other items like the fuses and the oil filter can also be quickly serviced.

FORD All servicing points are easy to get to, such as the oil dipstick, fuel tank filler neck, battery, brake master cylinder and oil filter.

PLYMOUTH Service station attendants have no complaint about filling the Fury with gas, oil or water, nor do they see any cause for concern in lubricating the chassis. The battery is where it can easily be checked, as is the oil filter (changed from below). A circuit breaker system eliminates the concern of changing fuses. Checking the brake fluid is difficult on power brake models.

Q. How easy is it to work on the engine?

CHEVROLET The distributor would be easy to work on, as would the fuel pump, but tuning three carburetors with complicated linkage is work for an expert. Mechanics should welcome the new location of the spark plugs, for now they are highly accessible.

FORD Mechanics and service station attendants noted with glee the location of the spark plugs *above* the exhaust manifold and the distributor on the forward top side. Tappets are easy to get to under the rocker covers. Even the carburetor should be no more difficult to tune than any equally normally complicated mechanism.

PLYMOUTH A mechanic's ability to tune the distributor on the engine would be aided because of its location. Changing the fuel pump would also be easy. Tuning the two carburetors would be difficult, while any attempt to change spark plugs—with all that power equipment—would be a real hassle.

CONCLUSIONS

Q. What are its best points?

CHEVROLET The Impala should easily win acceptance from the sports-minded automobile enthusiast. It's a solid car, with good cornering characteristics, plenty of power, and a chassis that should hold up under a rugged life.

FORD The Fairlane 500 is definitely a car for someone who likes to use a lead foot. It has plenty of power, and is built exceptionally well. (This is despite the fact that our test car had a few minor bugs, but it did not get the Quality Control Audit Check covered on page 16, this issue.)

PLYMOUTH The Fury well meets its purpose of providing a sports-type family car. Its best points are definitely its ease of handling, good cornering, outstanding performance, good assembly and finish.

Q. What should I check before buying?

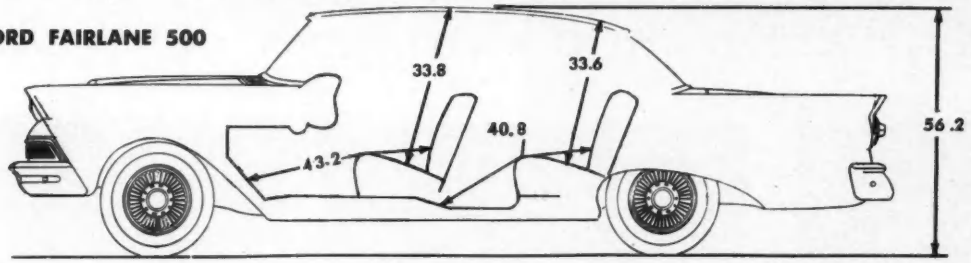
CHEVROLET Check your needs as to carrying more than one adult passenger; the rear seat is not adequate for taking adults on long trips. Check your pocketbook as regards your outlay for gasoline. Check your local traffic and highway conditions, for with the Impala you'll want to drive fast. **—Russ Kelly**

FORD Check your needs as to carrying rear seat passengers. Check legroom and driving position. Check your allowance for gasoline if you do much driving. Check your needs for a fast car—the Fairlane 500 *is* fast. **—Joe H. Wherry**

PLYMOUTH Check the seating position for yourself as driver. Check legroom in the rear. Check your needs as to fuel economy. Check the ride for it may be a bit stiff for the average buyer. Check out where you can drive fast—you will with the Fury. **—Robert D'Olivo**

SPECIFICATIONS OF TEST CARS ON TRIAL

FORD FAIRLANE 500



ENGINE: Ohv V8. Bore 4.00 in. Stroke 3.50 in. Stroke/bore ratio 0.88:1. Compression ratio 10.2:1. Displacement 352 cu. in. One 4-bbl. carburetor. Dual exhaust. Advertised bhp 300 @ 4600 rpm. Bhp per cu. in. 0.85. Piston speed @ max. bhp 2683 ft. per min. Max bmep 169.2 psi. Max torque 395 lbs.-ft. @ 2800 rpm.

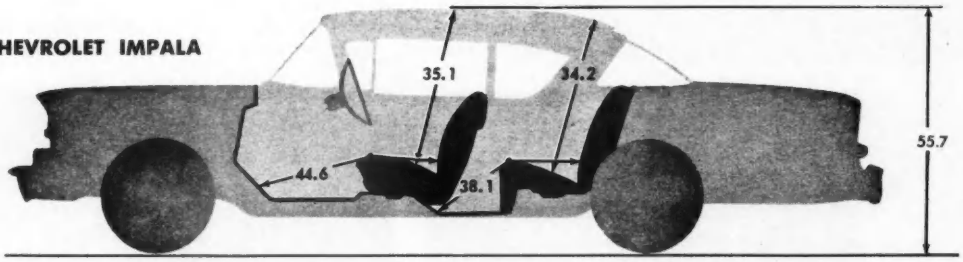
TRANSMISSION: Cruise-O-Matic, automatic three element torque converter with planetary gears.

CHASSIS: Front suspension—coil spring with control arms. Rear—semi-elliptic springs. 8.00 x 14 tubeless tires. Power steering, rack and sector, recirculating ball, 5.0 turns lock-to-lock, overall ratio 27.0:1, turning diameter approx. 40 ft. Rear axle—conventional differential, ratio 2.69:1.

DIMENSIONS: Wheelbase 118 in., overall length 207, overall height 56.2, overall width 78, front tread 59, rear tread 56.4, rear overhang 54.

PRICE: Factory suggested retail price of test car equipped as described including federal tax but not state and local taxes, delivery and handling charges or freight $3331.

CHEVROLET IMPALA



ENGINE: Ohv V8. Bore 4.13 in. Stroke 3.25 in. Stroke/bore ratio 0.79:1. Compression ratio 9.5:1. Displacement 348 cu. in. Three 2-bbl. carburetors. Dual exhaust. Advertised bhp 280 @ 4800 rpm. Bhp per cu. in. 0.80. Piston speed @ max. bhp 2600 ft. per min. Max. bmep 153.8 psi. Max. torque 335 lbs.-ft. @ 3200 rpm.

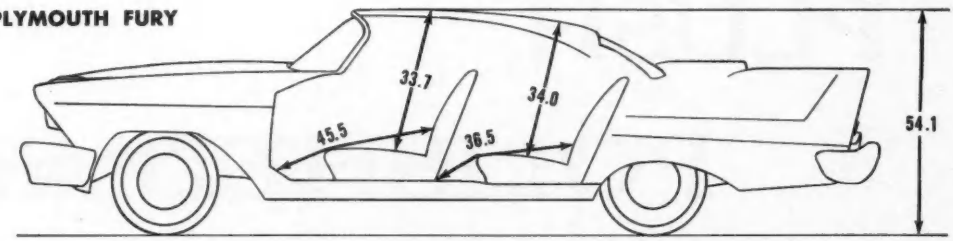
TRANSMISSION: Turboglide, automatic triple turbine torque converter with variable pitch stator; ratios 2.67:1, 1.63:1.

CHASSIS: Front suspension—independent coil springs with short and long control arms. Rear—coil springs with one upper and two lower control arms. 7.50 x 14 tubeless tires. Mechanical steering, semi-reversible, recirculating ball, 5.2 turns lock-to-lock, overall ratio 23:1, turning diameter (left) 37.2 ft., (right) 37.7 ft. Rear axle—Positraction, limited-slip differential, ratio 3.36:1.

DIMENSIONS: Wheelbase 118 in., overall length 209.1, overall height 55.7, overall width 77.7, front tread 58.8, rear tread 58.8, rear overhang 55.8. Weight with gas, oil and water 3669 lbs. (52% front, 48% rear), weight/bhp ratio 13.1:1.

PRICE: Factory suggested retail price of test car equipped as described including federal tax but not state and local taxes, delivery and handling charges or freight $3217.

PLYMOUTH FURY



ENGINE: Ohv V8. Bore 4.06 in. Stroke 3.38 in. Stroke/bore ratio 0.83:1. Compression ratio 10.0:1. Displacement 350 cu. in. Two 4-bbl. carburetors. Dual-breaker distributor. Dual exhaust. Advertised bhp 305 @ 5000 rpm. Bhp per cu. in. 0.87. Piston speed @ max bhp 2813 ft. per min. Max. bmep 159.4 psi. Max. torque 370 lbs.-ft. @ 3600 rpm.

TRANSMISSION: TorqueFlite, automatic three-element torque converter with planetary gears; ratios 2.45:1, 1.45:1, 1.00:1.

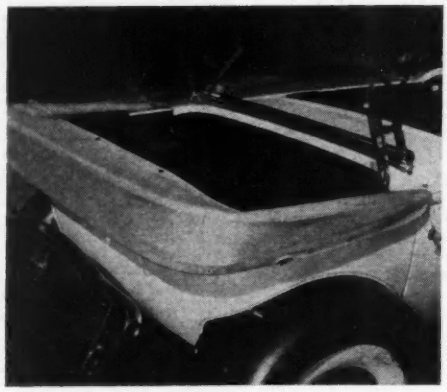
CHASSIS: Front suspension—independent, lateral, non-parallel control arms with torsion bars. Rear—unsymmetrical, semi-elliptical leaf springs. 8.00 x 14 tubeless tires. Power steering, rack and sector, 3.5 turns lock-to-lock, overall ratio 19.1:1, turning diameter 42.3 ft. Rear axle—conventional differential, ratio 3.31:1.

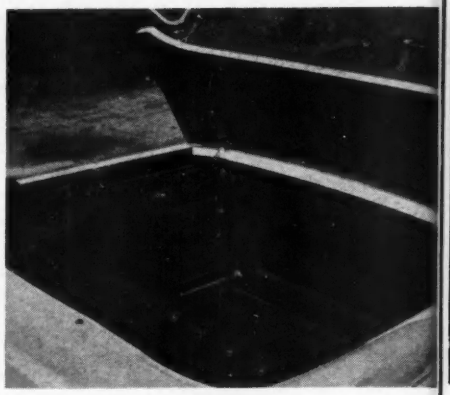
DIMENSIONS: Wheelbase 118 in., overall length 206, overall height 54.1, overall width 79.3, front tread 60.9, rear tread 59.6, rear overhang 55.2. Weight with gas, oil and water 3860 lbs. (56% front, 44% rear), weight/bhp ratio 12.6:1.

PRICE: Factory suggested retail price of test car equipped as described including federal tax but not state and local taxes, delivery and handling charges or freight $3168.

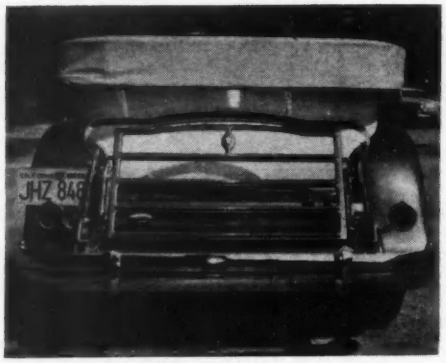
IF ANY CAR CAN BE TERMED A 'STANDARD' CLASSIC, IT'S THE PACKARD PHAETON

BEAUTY of Packard front end was automotive landmark during classic era.

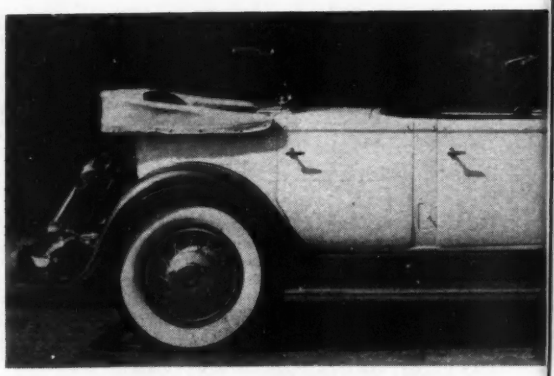




BEAUTIFUL INTERIOR is overshadowed only by the construction and design of the functional rear cowl. These pictures clearly illustrate why the dual cowl phaeton remains extremely popular with all classic car enthusiasts.



FUNCTIONAL CLASSIC design is enhanced by beauty rim around luggage rack. Rims were an accessory, now almost impossible to find.



TWO-TONE PAINT JOB does much to accentuate the wonderful design of one of the most popular classic cars in existence.

PLUSH, POLISHED and

by Robert J. Gottlieb Classic Car Editor

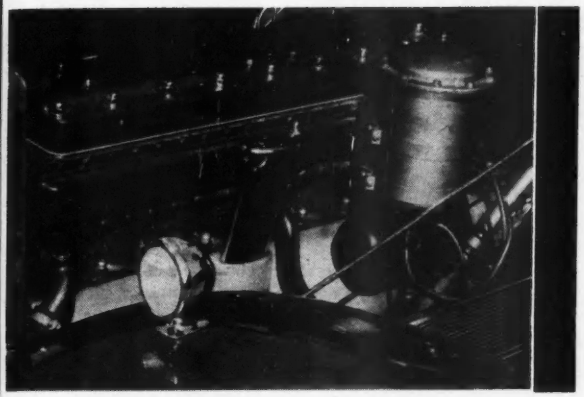
ANY CLASSIC ENTHUSIAST will immediately recognize this '32 dual cowl Packard phaeton. Built on the Super 8 chassis, the car was professionally restored by its owners, Mr. and Mrs. Don Hill of Inglewood, Calif.

Purchased in 1956 in original condition, the car was complete except for the radiator cap and side mount mirrors. A solid year was spent in restoration, during which time the phaeton acquired new brown leather upholstery, chrome, rubber and an off-white and cinnamon paint job. For additional spice and flash, the wheels are sprayed gold. Though this is not an original paint scheme, Mr. Hill feels that the flashy lacquer does much to attract attention and cause favorable comment; we wholeheartedly agree with him.

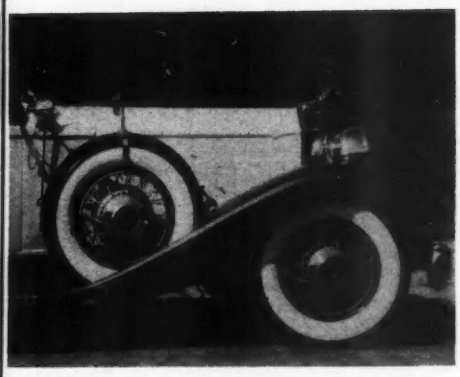
Taking meticulous care in restoring the classic, Mr. Hill made but one mistake. The car was sandblasted and it took four months of hard work to block sand the body panels back to the original mirror-like condition. A total of $4700 was invested in the car but the pleasure it gives its proud owners cannot be measured with money. As proof, both Mr. and Mrs. Hill advise that the car is *not* for sale at *any* price. /MT

IN ADDITION TO distinctive body design, Packard was always noted for beautiful interiors, outstanding dash panels.

PHOTOS BY AL PALACY



STRAIGHT 8 ENGINE was noted for silent, smooth operation, simplicity of design, high horsepower output per cubic inch, low speed torque.



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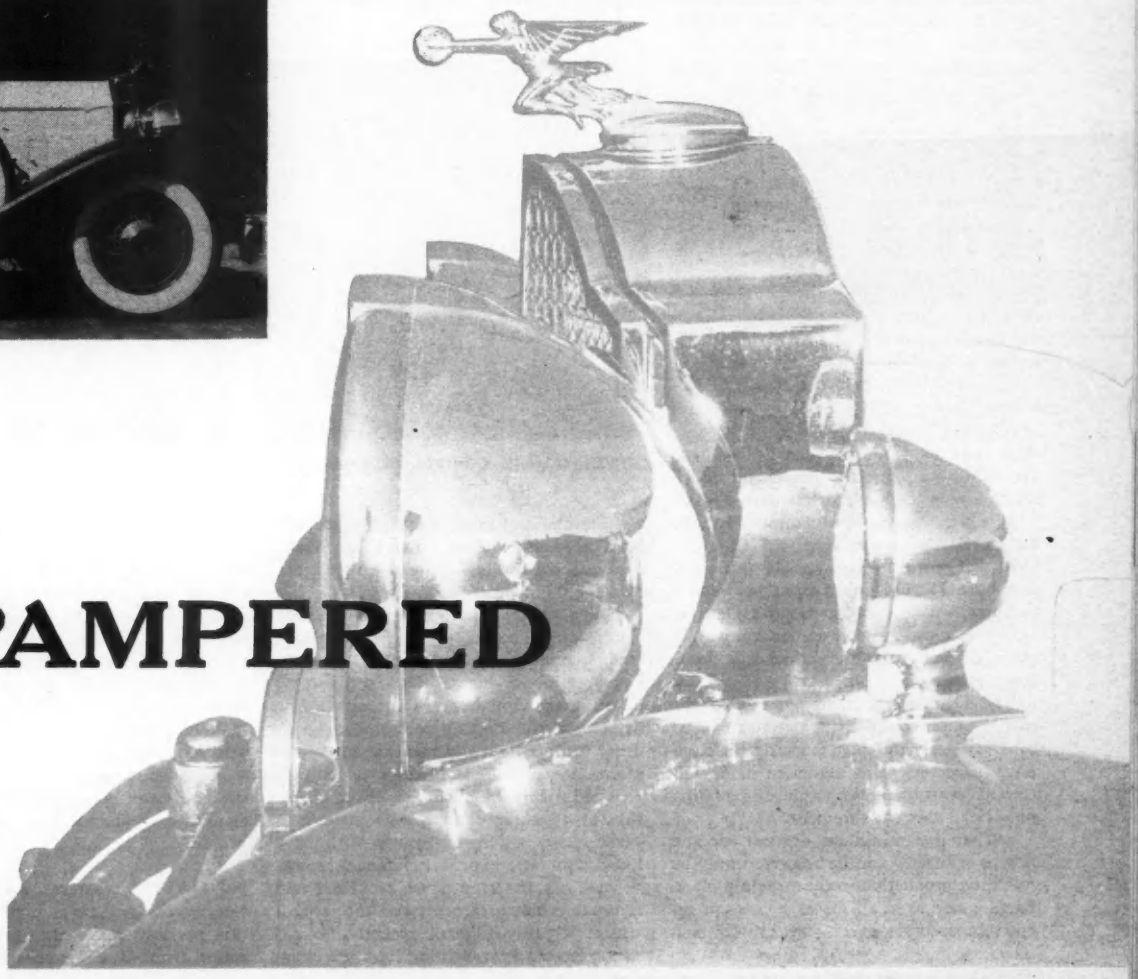


ARE THE '58s BUILT ANY BETTER?

The small still voice of car buyer complaints about sloppy workmanship has grown into an angry shout. Has Detroit heard it?

by William Carroll

FIRST WE EAT STEAK, then we eat crow," said Granville Sharpe, Quality Control Manager of the Chrysler Corp. Los Angeles assembly plant. Sharpe was speaking of the monthly meeting where Quality men from all over the nation meet to hear how their new cars compare.

And quality is important everywhere. At American Motors each car has over 2000 inspections before leaving the plant. A steering mechanism has 100 separate inspections, the body 500 and chassis about 1600. For Oldsmobile, 900 skilled inspectors check production constantly. The famous "Rocket" engine plant alone has 56 quality control stations, equipped with 882 precision gauges in constant operation.

Ford's new Audit Inspection system is covered in "Spotlight," page 16, while a more personalized touch is the overnight inspection of a car selected at random from production lines at Pontiac. The inspector is Semon Knudsen, a vice-president of General Motors and General Manager of Pontiac. He personally checks a different car every night and woe unto the inspector who consistently approves sloppy assembly at Pontiac.

From most factory viewpoints (Chrysler's at least) each car must be as much better than competition as possible. But there must be a line between Rolls-Royce (at $9500) attention to detail and delivery of a new hardtop for less than $3000.

When the previously mentioned dinner for Chrysler's men is over, the Chief of Quality Control begins to ask questions that hurt. During one session he wanted to know, "Why did last month's Detroit-built cars cause more customer complaints about dirt on upholstery than cars from other plants?"

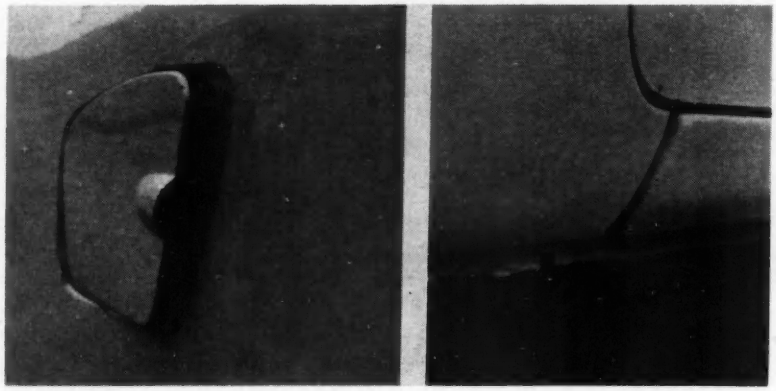
The Detroit representative offered the excuse of untrained help, but you can be sure that early the next morning his shipping inspectors were reminded in no uncertain terms of the importance of passing only clean cars for shipment.

"What is a minimum demerit car and how is it built?" can be answered only by watching production in the assembly plant. At Chrysler, as in all plants, a corps of inspectors observes every stage of car construction. Cards bearing Inspection's approval or repair notations follow the car through production all the way to shipping. Afterward the cards are filed as a permanent record of each car's construction history. A year later the plant can verify that the air conditioner of your car was operating perfectly when shipped and name the inspector who checked it.

Unique to Chrysler-built cars and separate from production inspectors are the Quality Control men. Considered the Inspector's Inspector, they use carefully devised methods of random sampling to pick from production lines a bare body shell, trimmed convertible or a completed car ok'd for shipment.

Using a detailed check list, the Quality Control man covers the entire assembly from stem to stern. His attitude: "Would I pay my money for it?" On the report he marks maximum demerits for any major defect directly affecting performance, handling or appearance of the car. Fewer demerits are given less obvious or quickly repaired errors which might affect operation or appearance. Only one demerit is given easily adjusted slip-ups such as a loose trim screw or misaligned chrome.

Each day the reports are tabulated and unusual problems are marked for investigation. Quality Control recently noticed that electric spot-welding was excellent for exactly four and one-half shifts, then quality sagged badly in the tail fin area. A conference was held with the welding foreman. It was discovered that metal electrodes of one spot-welder were operating efficiently for the four and a half shifts before burning over. But rather than shut down in the middle of a shift, maintenance crews were waiting until a break in production before installing new tips. Within 20 minutes written instructions reached the Maintenance Department, "Change all spot-weld electrodes every four shifts."



DETROIT QUALITY CONTROL ENGINEERS ARE STRIVING TO ELIMINATE SUCH DEFECTS AS

Other examples of quality control include, "Mystery of the Leaking Cars." Inspectors were dutifully reporting cars with a water leak over the driver's foot. At the same time Quality Control records not only showed the cars sent back for resealing but disclosed that the cars involved had been originally sealed after the seventh hour of the day shift. On the paint line it was soon determined that a replacement workman was moved to body sealing after the first seven hours. Minutes later he was again being shown how to do the job properly.

NO MATTER what car you buy, production quality will be as high as the factory can possibly make it. Certainly the interior trim of an expensive car will be

better than trim in the cheapest model of the same line. Additional value for the money lies in power assists, comfort items and the fact that an expensive model has a sizable pre-delivery budget built into the purchase price. It's fairly obvious that a dealer seeking your satisfaction can spend twice the money on pre-delivery of a $4000 car than can be spent preparing a $2000 car.

A recent letter from General Motors President Harlow H. Curtice to the National Automobile Dealer's Association discusses another point of view. Wrote Mr. Curtice in part, "All we say is that the public is entitled to have some choice, and to buy, if it wants to buy, from an automobile dealer that does not give quite as good service, but gives a lower price . . ."

What's it like from the other side of the fence?

The answer may lie in the dealer's showroom collection of poorly assembled cars offered for sale. What dealers think was demonstrated in a recent survey made by the trade publication *Automotive News,* which asked, "What do you believe would go far toward correcting (improving) the sales picture in 1958?"

First, most dealers wanted lower prices. Then they wanted something done about sloppy construction of the new cars!

No matter how you slice it, each factory seems sure the dealers are goofing off in preparation of new cars and in the handling of customer complaints.

Carried back as echoes on the same breeze are the dealer's shouts of "sloppy construction."

So the kettle calls the pot black.

AT LEAST WE KNOW what's not happening, or should we say what is supposed to happen. Hidden in the price of some cars, listed on the ticket of others is the "D & H" charge—or as spelled out, Delivery and Handling. Ranging from a low of nothing on some imports to over a hundred bucks for American luxury jobs, D & H money is earmarked to the dealer for putting your new car in top shape—BEFORE you drive the first mile. Usually D & H also covers warranty inspections a new car is given during its first few thousand miles of life. Minor adjustments? The dealer is supposed to do these as a service courtesy. Faulty parts? Replaced by the factory who often pays the dealer for installation at no charge to the customer.

To make D & H even easier, each new car reaches the dealer equipped with a detailed "Check Off" sheet. The list for one popular make shows 20 items under the hood, six electrical inspections, 10 places to check beneath the car, five on the body followed by three appearance operations and a road test.

But Mr. Curtice wasn't fooling. Some dealers won't do the work. We know a dealer of the Big Three who files Check Lists in the office, washes the cars, installs floor mats and trim and then advertises, "Every Car Serviced and Ready to Go." Another man selling a less popular make spends not less than one full man-day (about $30 labor and $60 overhead) on each new car before delivery. As a result he spends little time with unhappy customers and sells on the quality of his service. The first dealer sells by cutting prices. The factory considers each dealer the final 20 feet of an assembly line; inspecting, installing and preparing the cars for delivery in near-perfect condition.

A dealer believes the factory should be building finished cars and isn't pleased about being considered (by the purchaser, that is) the dog-wagging tail of automobile production.

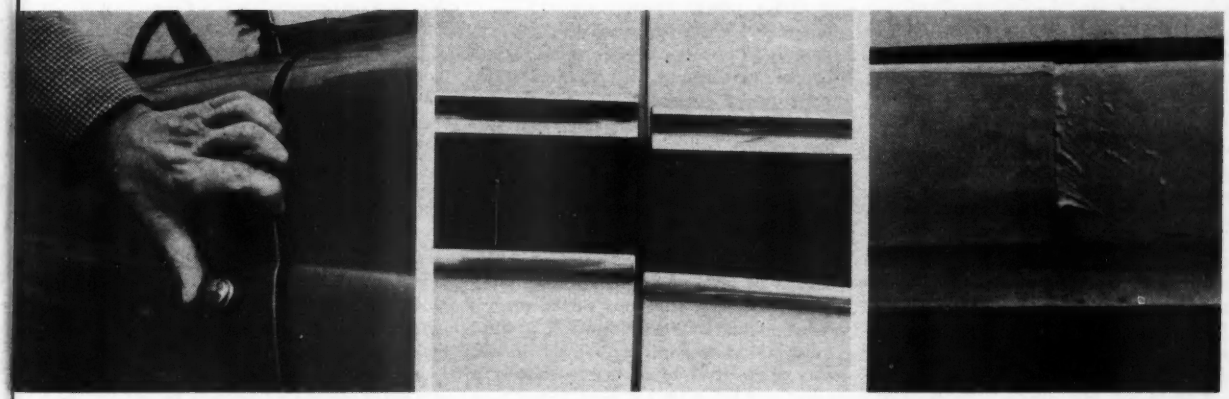
THE ANSWER to these riddles is simply the matter of a dollar. More than one of course, but still it's the buck causing all the trouble.

We all know there are only so many dollars involved in the buying and selling of a new car. The dealer has to buy, clean, display and deliver the car to you. If a good businessman he may save a few dollars along the line—but every one pays the same price for the same model of the same make. The super-sharp price-cutter doesn't try to save just a few dollars. He tries to save them all. A wash job is cheaper than eight hours of mechanic's time preparing a car. It's less expensive to display a couple of clean cars and let the rest gather dust on a vacant lot. Certainly selling cars in this manner may save as much as a hundred dollars per car. If the salesman is kind hearted, you may be able to buy a new car here for $25 to $35 less than from anyone else in town.

But what did you really save?

Not much when the chips are down. First you'll discover the car has minor faults which should have been eliminated before you ever saw it. Then when time arrives for warranty service you'll hear that old familiar refrain, "Sorry, but we can't touch it for a couple of weeks."

So wait two weeks to bring your jewel in with a list of things to be done. When you pick it up every item on the list will be carefully checked off. But that doesn't mean all the work was done. Usually the carburetor was adjusted, anything concerning safety cared for, the car lubricated (at your expense) and returned ready for the next 50,000 miles of troublesome service.



FILLER HATCHES WITH WEAK SPRINGS, MISMATED BODY PANELS, POORLY FITTING DOORS, MISALIGNED TRIM AND UNFINISHED WELDS.

By the time you have fought each two-bit problem back and forth with the service manager and brought the car in whenever he found time to "look at it" you'll find the $25 saving hasn't begun to repay you for the trouble.

Every factory service manager we have talked with says the same thing. "With all things being nearly equal, buy from the dealer with the best service facilities."

That is important enough to read twice.

WHAT HAPPENS when your neighbor ends up with a really unhappy car was the subject of a recent story in the *Wall Street Journal.* Mentioned was the lady sending lemon-decorated post cards to the auto factory president, a motorist smashing his ailing auto through the dealer's showroom window, and the over 100,000 letters hit-

continued on page 86

They've made engines more powerful . .
styling more dramatic . . . riding more comfortable . . .

"But What Have They Done About Safety?"

by William Carroll

WITHOUT A BACKWARD GLANCE the man stooped to slash a seat belt with his knife. Twice he had to cut before the web strap separated from its floor anchor. Within 15 minutes the knife wielder cut belts from every car in the dealer's showroom.

The time: eight years ago, when Nash hopefully installed seat belts in their 1950 models. But John Q. Public took one look and said, "Do I have to use a seat belt to ride in this automobile?" The negative reaction hurt Nash sales, and dealers began cutting safety out of new cars before the factory eliminated the belts as standard equipment.

By 1955 every motor car maker had men trying to find answers to problems of car safety. Dealers were displaying padded instrument panels and optional seat belts, when in mid-1955 some General Motors production lines began quietly installing new safety latches that reduced chances of doors opening in an accident.

Ford teed off its 1956 models with a "Lifeguard" safety program of padded dash, seat belts, safety steering wheel and advertising. Results were something less than happy. Of the 1956 models, 500,000 had padded dashes. Approximately 100,000 were equipped with seat belts. And Ford lost a whopping $800,000 on installation of the safety devices. Other makers quietly followed Ford. Dished steering wheels and safety door latches could be found on almost every make, with dash padding and seat belts an extra cost option on many.

JULY OF THE SAME YEAR found a Congressional investigation beating the safety bushes around Detroit. The Special Subcommittee on Traffic Safety of the Committee on Interstate and Foreign Commerce set out, as part of their aim, ". . . to determine the extent to which excessive speed, intoxication, lack of adequate safety inspection of vehicles, insufficiently strict state and local laws, poor condition of highways and other factors have been responsible for such increase and for resulting deaths . . ."

Perusal of the Committee's 927-page hearings transcript shows that about half their time was spent in Detroit watching crash tests and listening to auto "brass" thump the tub for each corporation's safety research.

Meetings held for the Roberts Committee included one where American Motors president, George Romney, made a good pitch for unitized body construction (in Rambler and now in '58 Lincoln) by saying, "When we started with unit body-frames we had about 6000 foot-pounds per degree of deflection [unsupported frame corners are weighted to determine how much force is required to bend them one degree], as opposed to competitive cars that ran from a low of 2000 foot-pounds up to as high as 4000. In our latest (1956) cars we are up as high as 7000 foot-pounds torsional resistance per degree of deflection. With conventional construction the lowest is now about 4000, the highest around 5000 foot-pounds."

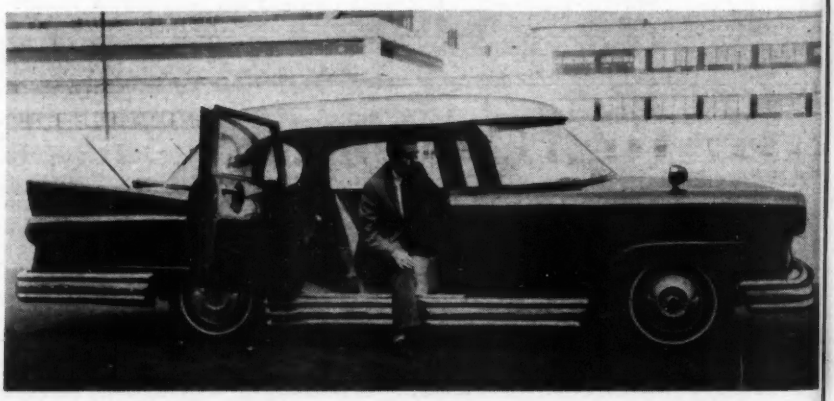
At Chrysler's proving grounds in Ypsilanti, Mich., the Committee was shown charts covering such esoteric subjects as roll angle, suspension frequencies, steering geometry, etc. Revealing was a discussion of problems in designing a safety door latch. Test engineers ruined many a sedan to find out what kind of a wreck caused doors to pop open. Finally in rollover tests at 45 mph, they succeeded in opening one or more doors every time.

Meanwhile the designers offered several new latches. One was accepted for rollover testing. But at the proving grounds, doors still opened, though laboratory tests had convinced the engineers that they couldn't.

There was a lot of soul-searching and inspection of slow-motion movies before the villain was found: the outside door handles had been snagging themselves open as the car rolled. Engineers began locking their new doors on the inside and since then have not been able to pop a single locked door equipped with the safety latch.

Ford went all out to demonstrate methods of test-crashing cars, evaluating dished safety steering wheels and test instrument panel safety pads designed to absorb the collision impact of nearly-human dummies. A chart ("Passenger Car Horsepower vs. Traffic Fatality Rate") thoroughly stoned soapboxers who shouted of dangerous high horsepower. The chart showed that since 1935 fatalities per 100 million miles of driving have dropped from 8 to 4.5 (National Safety Council says 8 to 6.4). During this period, horsepower rose from an average of slightly over 100 per car to nearly 180.

General Motors put on demonstrations which utilized findings of their research into the often suggested "Shock Absorbing Bumper." They slide-ruled that to stop a car at a rate similar to maximum brake use on dry pavement, the shock absorbing bumper would have to be 11 inches from the front of a car traveling only five mph. The bumper would have to be extended 177 inches—or almost a car length in front of the body!—to safely stop a car from a speed of 20 mph.



GM also displayed a sedan with rearward facing seats. Seatbacks on the driver's right interfered with his vision and rear seat passengers had no room for their feet because of a hump for the rear axle.

Time ran short before the Roberts Committee could visit Studebaker-Packard, so Safety Engineer Donald Schrum came to the Committee. He pointed out that S-P offered what everyone else had (safety door latches, padded panels, seat belts, etc.) plus touches of their own. Mentioned were the nearly eye-level speedometers minimizing the time a driver's eyes must leave the road, and fade-resisting finned brake drums on more powerful V8s.

While auto makers and Congressmen were dancing around the Maypole of traffic safety, the work done in 1955 by design engineers began appearing on the market.

A year and a half later the United Press issued a report on auto safety based on studies by the Cornell University Project. UP stated, "Drivers and passengers were as likely to get injured or killed in cars of the 1950-'54 vintage (10.5 per cent hardtops) as in older vehicles dating from 1940-'49 (two per cent hardtops), though in some cases the newer cars resulted in more frequent and severe injuries. But this was not due to such factors as 'thinner corner posts and collapsing roofs,' but rather to other reasons such as interior design and the tendency of unsupported hardtop doors to pop open."

"The plain fact is," said one Cornell researcher quoted in the UP report, "there is little difference between a 1954 car and a 1940 car as to the injuries that can be sustained in each. Now that manufacturers have begun to adopt such devices as belts, padded panels, safety door locks, etc., it is possible to say that you stand less chance of getting hurt in a 1956 or 1957 car than in earlier models."

In dealers' showrooms it's a different story. Loaded cars usually have factory safety kits (dash and visors) as part of the deal. Buy the car, you'll get safety too. But practically no car in the showroom of a metropolitan dealer is equipped with safety belts. If you order them, you'll have to wait 'til a set is found to match the upholstery. And get a firm price first. A Plymouth purchaser paid over $50 for two standard belts, and the dealer swore the charge was legitimate.

ON THE '58s safety is well advertised. Each maker points to lower centers of gravity, better handling, better brakes, better visibility, and brighter colors. New X-type GM frames were crash tested for resistance to side impact. Design improvements resulting from the tests were thicker body rocker panels and more rigid sheet metal for body members. Ford's lower-price cars use a "cowbelly"-type frame which acts as a sturdy steel bumper along both sides of the car. Lincoln has turned to a unitized body—long used by American Motors—which seems to have great resistance to collision damage. Studebaker-Packard uses welded box-type doors for resistance against side impact.

But men behind the pencil are frankly stumped. Where do we go from here? How much safety can be built into a production car? Would the public (you, that is) pay $300 more for a safety car on the chance of being in that one fatal collision every 16 million miles? "Will safety sell?" That is the really hard nut Detroit has to crack.

The speed that most of us drive on cross country trips has risen only slightly. Cornell reports that average car speeds on the highway are about 30 mph in urban districts, a nominal 50 mph in rural areas. When it comes to relating speed and accidents, figures on the speedometer change. The report shows that impact speed of cars (the speed at which they become an accident statistic) averaged only 42 mph in the country and 27 mph in urban areas.

WHAT THIS ADDS UP TO is stated simply by the *Wall Street Journal:* "What is curiously overlooked in the talk of safety is the simple fact that the more cars there are on the roads, the more accidents there are bound to be, just as a population increase means an increase in crime. This may be unfortunate, but it is pretty difficult to imagine any feasible way of restricting the volume of traffic. In any case, the notion that drivers are getting more reckless is a statistical illusion."

If accidents are going to be with us for some time, you might wonder what the odds are against one. In 1956 the figures worked out to a collision every 61,000 miles, an injury every 430,000 miles and one fatality every 16 million miles of motor vehicle travel.

Has there been a reduction in the death rate? The National Safety Council answer is a definite "Yes." Their charts show the traffic fatality rate has already fallen from 15.1 fatalities per 100 million miles in 1936 to 6.4 fatalities per 100 million miles as of 1955. And the reduction in fatalities per mile was during a period when the number of motor vehicles in use *more than doubled.*

SO—NOW WHAT? Cars are safer. Roads are no worse and are getting better. Speeds have not jumped out of hand, nor has speed been proven the prime cause of accidents.

That leaves safety up to you.

Do you keep your full attention on road conditions ahead? (In 19 per cent of urban and 16 per cent of rural accidents the car hit an immovable object!)

Do you figure that slowing down when the highway twists and turns is less expensive than injuries from a rollover? (Twenty-six per cent of rural accidents—and one per cent of urban—occur when the car rolls over, without any collision.)

Does the other driver always know what you're going to do next? (Simple car-to-car collisions make up 49 per cent of urban and 35 per cent of rural accidents.)

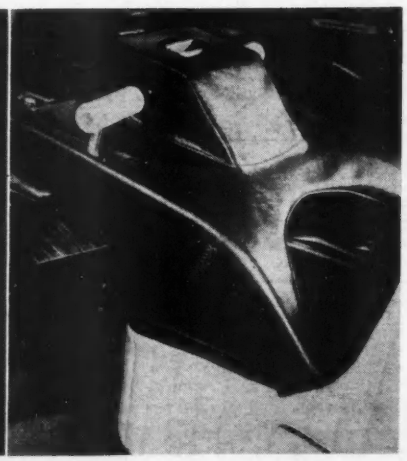
Did you know that windshields are damaged by the occupant's head in 25 per cent of the collisions? Instrument panels are damaged by the occupant's head or body in 16 per cent of urban and 24 per cent of rural accidents? (Reports already prove that safety belts will reduce damage to both you *and* the car.)

Hospital records show that major causes of serious injury are the steering assembly (29.4 per cent), instrument panel (20.6 per cent), windshield (16.9 per cent), and ejection through an opened door (14.6 per cent). (If you spend about $35 for seat belts—correctly anchored—and a padded dash in a new car with dished steering wheel and safety door locks, you can greatly reduce your chances of being hurt by more than 80 per cent of the major causes of collision injury.)

"What have I done for safety?" may be the real question to ask the owner of your car. For as any doctor will tell you, it's people—not cars—that get killed in an accident. /MT

A KEY TO SAFETY

may be found in the Cornell-Liberty Safety Car, developed after five years of research. Its concept of "packaging" passengers against impact injury could serve as a guide for auto makers. Driver is secured in centered seat by adjustable panel with protective chest cushion between steering handles (right). Fifty unique features include rear-hinged double doors with steel locking shafts fitting body framing, built-in roll bars, bucket-type seats for passengers, wrap-around bumpers mounted to extended frame.



'58 Specifications

MAKE AND MODEL	Standard or Typical Engines (See opposite page for options)									Transmission Available	Rear Axle Ratios			Dimensions					Steer'g Wheel Turns—Lock-to-Lock		Turning Circle—feet	Standard Tire Size	Approx. Shipping Weight * 4-D Sedan
	Cylinder & Valve Arrangement	Maximum Bhp @ rpm	Maximum Torque—lb.-ft. @ rpm	Bore & Stroke—in.	Displacement—cu. in.	Compression Ratio	Bhp/cu. in. Displacement	Number carbs/barrels	Dual Exhausts Standard		Conventional	Overdrive	Automatic	Wheelbase	Widest Tread	Overall Length	Overall Width	Overall Height—Sedan	Mechanical	Power			
Ambassador	V8 O	270@4700	360@2600	4.00x3.25	327	9.7:1	.83	1/4	Yes	C, A, OD	4.10	4.10	3.15	117	59	200	72	58	4.7	4.8	40	8.00x14	3462
Buick Special (C)	V8 O	NA	NA	4.13x3.40	364	8.0:1	NA	1/2	No	C	3.58	NA	—	122	60	212	76	58	5	4	43	7.10x15	NA
Special (A)	V8 O	250@4400	380@2400	4.13x3.40	364	9.5:1	.69	1/2	No	A	—	—	3.23	122	60	212	76	58	5	4	43	7.10x15	4150
Century	V8 O	300@4800	400@3200	4.13x3.40	364	10.0:1	.83	1/4	Yes	A	—	—	3.23	122	60	212	76	57	5	4	43	7.60x15	4254
Super	V8 O	300@4800	400@3200	4.13x3.40	364	10.0:1	.83	1/4	Yes	A	—	—	3.23	126	61	219	80	59	5	4	45	7.60x15	4516
Roadmaster	V8 O	300@4800	400@3200	4.13x3.40	364	10.0:1	.83	1/4	Yes	A	—	—	3.23	126	61	219	80	60	5	4	45	8.00x15	4602
Limited	V8 O	300@4800	400@3200	4.13x3.40	364	10.0:1	.83	1/4	Yes	A	—	—	3.23	126	61	227	80	60	5	4	45	8.00x15	4630
Cadillac 62	V8 O	310@4800	405@3100	4.00x3.63	365	10.25:1	.85	1/4	Yes	A	—	—	3.07	130	NA	217	80	59	NA	NA	43	8.00x15	NA
60	V8 O	310@4800	405@3100	4.00x3.63	365	10.25:1	.85	1/4	Yes	A	—	—	3.07	133	NA	225	80	59	NA	NA	45	8.00x15	NA
Eldorado	V8 O	335@4800	405@3400	4.00x3.63	365	10.25:1	.92	3/2	Yes	A	—	—	3.07	130	NA	223	80	58	NA	NA	43	8.20x15	NA
75	V8 O	310@4800	405@3100	4.00x3.63	365	10.25:1	.85	1/4	Yes	A	—	—	3.36	150	NA	237	80	62	NA	NA	52	8.20x15	NA
Eldorado Brougham	V8 O	335@4800	405@3400	4.00x3.63	365	10.25:1	.92	3/2	Yes	A	—	—	3.36	156	NA	216	80	56	NA	NA	42	8.40x15	NA
Chevrolet Delray, Biscayne, Bel Air																							
W/6	6 O	145@4200	215@2400	3.56x3.94	235.5	8.25:1	.62	1/1	No	C, A, OD	3.55	4.11	3.36	118	59	209	78	57	5.2	5.2	41	7.50x14	①
W/283 cu. in. V8	V8 O	185@4600	275@2400	3.88x3.00	283	8.5:1	.65	1/2	No	C, A, OD②	3.55	4.11	3.36	118	59	209	78	57	5.2	5.2	41	7.50x14	①
W/348 cu. in. V8	V8 O	250@4400	355@2800	4.13x3.25	348	9.5:1	.72	1/4	Yes	C, A	3.55	—	3.36	118	59	209	78	57	5.2	5.2	41	7.50x14	①
Corvette	V8 O	230@4800	300@3000	3.88x3.00	283	9.5:1	.81	1/4	Yes	C, A	3.70	—	3.55	102	59	177	73	51	3.7	—	37	6.70x15	2781
Chrysler Windsor	V8 O	240@4800	385@2000	3.94x3.63	354	10.0:1	.82	1/2	No	C, A	3.73	—	2.93	122	61	218	80	57	5.2	3.5	44	8.00x14	NA
Saratoga	V8 O	310@4600	405@3200	3.94x3.63	354	10.0:1	.87	1/4	Yes	A	—	—	2.93	126	61	220	80	57	—	3.5	47	8.50x14	NA
New Yorker	V8 O	345@4600	450@2800	4.00x3.90	392	10.0:1	.88	1/4	Yes	A	—	—	2.93	126	61	220	80	58	—	3.5	47	9.00x14	NA
300-D	V8 O	380@5200	435@3600	4.00x3.90	392	10.0:1	.97	2/4	Yes	A	—	—	3.31	126	61	220	80	55	—	3.5	47	9.00x14	NA
De Soto Fireswept	V8 O	280@4600	380@2400	4.06x3.38	350	10.0:1	.80	1/2	No	C, A	3.54	—	3.15	122	61	217	78	57	5.2	3.5	44	8.00x14	NA
Firedome	V8 O	295@4600	390@2400	4.12x3.38	361	10.0:1	.82	1/2	No	C, A	3.54	—	3.15	126	61	219	78	57	5.2	3.5	47	8.50x14	NA
Firelite	V8 O	305@4600	400@2800	4.12x3.38	361	10.0:1	.85	1/4	No	A	—	—	3.15	126	61	219	78	57	5.2	3.5	47	8.50x14	NA
Adventurer	V8 O	345@5000	400@3600	4.12x3.30	361	10.25:1	.96	2/4	Yes	A	—	—	3.31	126	61	219	78	55	5.2	3.5	47	8.50x14	NA
Dodge Coronet	6 L	138@4000	208@1600	3.25x4.63	230	8.0:1	.60	1/2	No	C, A	3.90	—	3.73	122	61	214	78	57	5.2	3.5	44	7.50x14	NA
Custom Coronet	V8 O	252@4400	345@2400	3.68x3.80	325	8.5:1	.78	1/2	No	C, A	3.54	—	3.15	122	61	214	78	57	5.2	3.5	44	7.50x14	NA
Royal	V8 O	285@4400	355@2800	3.68x3.80	326	9.0:1	.82	1/4	No	C, A	3.54	—	3.15	122	61	214	78	57	5.2	3.5	44	8.00x14	NA
Custom Royal	V8 O	295@4800	385@2800	4.60x3.38	350	10.0:1	.84	1/4	Yes	C, A	3.31	—	3.15	122	61	216	78	57	5.2	3.5	44	8.00x14	NA
Edsel Ranger, Pacer	V8 O	303@4600	400@2800	4.05x3.50	361	10.5:1	.84	1/4	No	C, A, OD	3.58	3.70	2.91	118	59	213	79	56	5.0	5.0	42	8.00x14	④
Corsair, Citation	V8 O	345@4800	475@2900	4.20x3.70	410	10.5:1	.84	1/4	⑤	A	—	—	2.91	124	59	219	80	57	5.0	4.8	43	8.50x14	⑧
Ford Custom, Custom 300	V8 O	205@4500	295@NA	3.75x3.30	292	9.1:1	.70	1/2	No	C, A, OD	3.56	3.56	2.91	116	59	203	79	57	5.0	5.0	40	8.00x14	NA
Fairlane	V8 O	240@4600	NA	4.00x3.30	332	9.5:1	.72	1/2	No	C, A, OD	3.58	3.58	2.91	118	59	207	79	56	5.0	5.0	40	8.00x14	NA
Fairlane 500	V8 O	265@N.S.	NA	4.00x3.30	332	9.5:1	.80	1/4	No	C, A, OD	3.58	3.58	2.91	118	59	207	79	56	5.0	5.0	40	8.00x14	NA
Imperial	V8 O	345@4800	450@2800	4.00x3.90	392	10.0:1	.88	1/4	Yes	A	—	—	2.93	129	62	226	81	57	—	3.5	48	9.50x14	NA
Lincoln Premiere & Capri	V8 O	375@4800	490@3100	4.30x3.70	430	10.5:1	.87	1/4	Yes	A	—	—	2.87	131	61	229	80	57	—	3.3	44	9.00x14	⑥
Continental	V8 O	375@4800	490@3100	4.30x3.70	430	10.5:1	.87	1/4	Yes	A	—	—	2.87	131	61	229	80	57	—	3.3	44	9.00x14	4888
Mercury Monterey	V8 O	312@4600	405@2900	4.30x3.30	383	10.5:1	.82	1/4	No	C, A, OD	3.56	3.56	2.89	122	59	213	81	57	5.5	4.5	44	8.00x14	NA
Montclair	V8 O	330@4800	425@3000	4.30x3.30	383	10.5:1	.86	1/4	No	A	—	—	2.89	122	59	213	81	57	5.5	4.5	44	8.00x14	NA
Park Lane	V8 O	360@4600	460@3000	4.30x3.70	430	10.5:1	.84	1/4	Yes	A	—	—	2.91	125	59	220	81	57	5.5	4.5	45	8.50x14	NA
Oldsmobile Dynamic 88	V8 O	285@4400	380@2400	4.00x3.69	371	10.0:1	.72	1/2	No	C, A	3.64	—	3.07	123	59	208	79	57	4.8	4	42	8.50x14	3985
Super 88	V8 O	305@4400	410@2800	4.00x3.69	371	10.0:1	.82	1/4	No	C, A	3.64	—	3.23	123	59	208	79	57	4.8	4	42	8.50x14	4008
98	V8 O	305@4600	410@2800	4.00x3.69	371	10.0:1	.82	1/4	Yes	A	—	—	3.42	127	59	217	79	57	—	4	43	8.50x14	4316
Packard	V8 O	225@4800	305@3000	3.56x3.63	289	8.3:1	.78	1/4	NA	C, A, OD	3.54	4.09	3.31	121	57	207	76	56	NA	NA	NA	NA	NA
Packard Hawk	V8 O S	275@4800	333@3200	3.56x3.63	289	7.8:1	.95	1/2	Yes	A	—	—	3.31	121	NA	205	73	55	4.5	4.5	NA	8.00x14	3500
Plymouth Plaza, Savoy, Belvedere	V8 O	225@4400	330@2800	3.91x3.31	318	9.0:1	.71	1/2	No	C, A, OD	3.54	3.91	3.15	118	61	206	79	57	4.8	3.5	42	7.50x14	NA
Fury	V8 O	290@5200	330@3600	3.91x3.31	318	9.25:1	.91	2/4	No	C, A	3.73	—	3.31	118	61	206	79	54	4.8	3.5	42	8.00x14	NA
Pontiac Chieftan	V8 O	240@4500	354@2600	4.06x3.56	370	10.0:1	.65	1/2	No	C, A	3.42	—	3.23	122	59	211	77	57	5.0	4.3	NA	8.00x14	NA
Super Chief	V8 O	240@4500	354@2600	4.06x3.56	370	10.0:1	.65	1/2	No	C, A	3.42	—	3.23	124	59	216	77	57	5.0	4.3	NA	8.00x14	NA
Star Chief	V8 O	255@4500	360@2600	4.06x3.56	370	10.5:1	.69	1/4	No	C, A	3.42	—	3.23	124	59	216	77	57	5.0	4.3	NA	8.00x14	NA
Bonneville	V8 O	255@4500	360@2600	4.06x3.56	370	10.5:1	.69	1/4	No	C, A	3.42	—	3.23	122	59	212	77	56	5.0	4.3	NA	8.00x14	NA
Rambler 6	6 O	127@4200	180@1600	3.13x4.30	195.6	8.7:1	.65	1/1	No	C, A, OD	3.78	4.38	3.31	108	58	191	72	58	4.7	3.6	37	6.40x15	2960
Rambler Rebel	V8 O	215@4900	260@2500	3.50x3.30	250	8.7:1	.86	1/4	Yes	C, A, OD	4.10	4.44	3.55	108	58	191	72	58	4.8	4.2	38	7.50x14	3313
Studebaker Scotsman	6 L	101@4000	152@1800	3.00x4.38	185.6	7.8:1	.54	1/1	No	C, OD	3.54	3.54	—	117	57	202	76	58	4.5	—	38	6.40x15	2725
Champion	6 L	101@4000	152@1800	3.00x4.38	185.6	7.8:1	.54	1/1	No	C, A, OD	4.1	4.56	3.54	117	57	202	76	58	4.5	4.25	38	6.40x15	2810
Commander	V8 O	180@4500	290@2800	3.56x3.25	259.2	8.3:1	.70	1/2	No	C, A, OD	3.54	3.73	3.31	117	57	202	76	58	4.5	4.25	38	7.50x14	3140
President	V8 O	225@4500	305@3000	3.56x3.63	289	8.3:1	.78	1/4	Yes	C, A, OD	3.54	3.91	3.31	121	57	206	76	58	4.5	4.25	41	8.00x14	3270
Silver Hawk 6	6 L	101@4000	152@1800	3.00x4.38	185.6	7.8:1	.54	1/1	No	C, A, OD	4.1	4.56	3.54	121	57	204	71	55	4.5	4.25	41	6.40x15	2800
Silver Hawk V8	V8 O	210@4500	300@2800	3.56x3.63	289	8.3:1	.73	1/2	Yes	C, A, OD	3.54	3.92	3.31	121	57	204	71	55	4.5	4.25	41	7.50x14	3196
Golden Hawk	V8 O S	275@4800	333@3200	3.56x3.63	289	7.8:1	.95	1/2	Yes	A, OD	—	4.27	3.31	121	57	204	71	55	4.5	4.5	41	8.00x14	3425

A—Automatic transmission
C—Conventional transmission
F.I.—Fuel injection
L—L-Head (side valves)
NA—Information not available
O—Overhead valves
OD—Overdrive transmission
S—Supercharged

① **Delray 3439, Biscayne 3447, Bel Air 3467**
② **Not available with fuel injection**
③ **Standard on convertible**
④ **Ranger 3805, Pacer 3826**
⑤ **Corsair 4235, Citation 4230**
⑥ **Capri 4754, Premiere 4802**

'58 Engine Options

MAKE AND AVAILABILITY	Cylinder-Valve Arrangement	Maximum Bhp @ rpm	Max. Torque —Lb-ft @ rpm	Bore & Stroke—in.	Displacement —cu. in.	Compression Ratio	Bhp/cu. in. Displacement	Number carbs/barrels	Fuel Injection Optional	Special Camshaft	Dual Exhausts Standard
Chevrolet—All models	V8 O	230@4800	300@3000	3.88x3.00	283	9.5:1	.81	1/4	No	No	No
All models	V8 O	250@5000	305@3800	3.88x3.00	283	9.5:1	.88	F.I.	—	Yes	No
All models except Corvette	V8 O	280@4800	355@3200	4.13x3.25	348	9.5:1	.80	3/2	No	No	Yes
Corvette	V8 O	245@5000	300@3800	3.88x3.00	283	9.5:1	.87	2/4	No	No	Yes
Corvette	V8 O	290@6200	NA	3.88x3.00	283	10.5:1	1.03	F.I.	—	Yes	Yes
Chrysler 300-D	V8 O	390@5200	435@3600	4.00x3.90	392	10.0:1	1.00	F.I.	—	No	Yes
De Soto Firesweep	V8 O	295@4600	385@2800	4.06x3.38	350	10.0:1	.84	1/4	No	No	Yes
Adventurer	V8 O	355@5000	400@3600	4.12x3.38	361	10.25:1	.99	F.I.	—	Yes	Yes
Dodge—All models	V8 O	305@4800	400@2800	4.12x3.38	361	10.0:1	.84	1/4	No	No	Yes
All models	V8 O	320@4800	400@2800	4.12x3.38	361	10.0:1	.89	2/4	No	No	Yes
All models	V8 O	333@4800	400@2800	4.12x3.38	361	10.0:1	.92	F.I.	—	No	Yes
Ford—All models except Sunliner & Skyliner	6 O	NA	NA	3.62x3.60	223	8.6:1	NA	1/1	No	No	No
Custom, Custom 300	V8 O	NA	NA	4.00x3.30	332	9.5:1	NA	1/4	No	No	Yes
All models except Custom & Custom 300	V8 O	300@ NA	395@2800	4.00x3.50	352	10.2:1	.85	1/4	No	No	Yes
Lincoln Capri, Premiere, Continental	V8 O	400@5200	480@3200	4.30x3.70	430	10.5:1	.93	3/2	No	No	Yes
Mercury—All models	V8 O	400@5200	480@3200	4.30x3.70	430	10.5:1	.93	3/2	No	No	NA
Montclair Turnpike Cruiser	V8 O	360@4600	480@3000	4.30x3.70	430	10.5:1	.84	1/4	No	No	No
Plymouth Plaza, Savoy, Belvedere	L 6	132@3600	205@1200	3.25x4.63	230	8.0:1	.57	1/1	No	No	No
Same	V8 O	250@4400	340@2800	3.91x3.31	318	9.0:1	.79	1/4	No	Yes	Yes
All models	V8 O	305@5000	370@3600	4.06x3.38	350	10.0:1	.87	2/4	Yes	No	Yes
All models except Suburban	V8 O	315@5000	370@3600	4.06x3.38	350	10.0:1	.90	F.I.	—	No	Yes
Pontiac Chieftan, Super Chief w/A	V8 O	270@4600	388@2800	4.06x3.56	370	10.0:1	.73	1/2	No	No	No
All models	V8 O	285@4800	395@2800	4.06x3.56	370	10.0:1	.80	1/4	No	No	No
All models	V8 O	300@4600	400@3000	4.06x3.56	370	10.5:1	.81	3/2	No	No	No
All models	V8 O	310@4800	400@3400	4.06x3.56	370	10.5:1	.84	F.I.	—	No	No
Rambler 6	6 O	138@4500	185@1800	3.13x4.25	195.6	8.7:1	.72	1/2	No	No	No
Studebaker Commander	V8 O	195@ NA	NA	3.56x3.25	259.2	8.3:1	.70	1/4	No	No	Yes
Silver Hawk V8	V8 O	225@ NA	305@3000	3.56x3.63	289	8.3:1	.78	1/4	No	No	Yes

Optional Rear Axle Ratios

Cadillac 60, 62, Eldorado	3.36
75	3.77
Chevrolet Corvette	4.11
	4.56
Chrysler Windsor	3.15
	3.31
Chrysler Saratoga	3.15
Chrysler New Yorker	3.15
	3.31
De Soto Firesweep	3.31
Dodge—All models	3.31
Ford Skyliner	3.70
Ford—All models	3.10
	2.69
Imperial w/air cond.	3.15
Lincoln	3.07
Mercury	2.91
Plymouth 6 cyl models (C)	3.73
(OD)	4.1
(A)	3.73
Savoy, Belvedere (A)	3.31
Rambler 6 (C)	4.38
(C)	4.11
(OD)	4.11
(A)	3.78
Rambler Rebel (C)	4.44
(OD)	4.10
(A)	3.15

POWER

Instant *power* for quick starting . . . Dependable *power* ready when you need it most . . . Long-lasting *power* that costs you less per month or mile. Yours with a powerful EXIDE.

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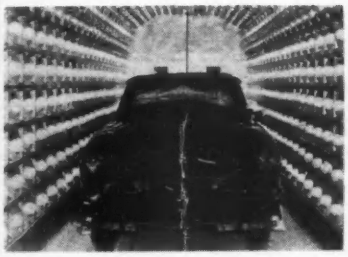

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HANDY hints

by Rodger Darling

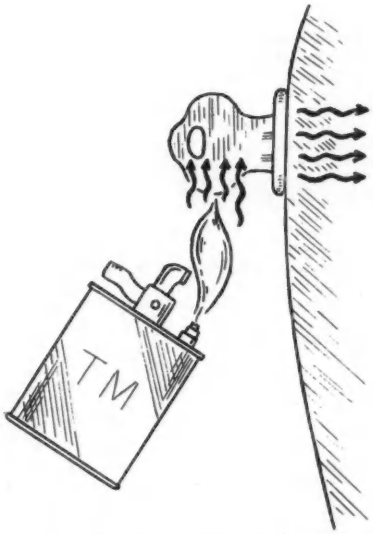
MORE HEAT FROM HEATER—1—Switch heater hoses for a few days (preferably before cleaning your car's cooling system) to "reverse flush" heat-stealing deposits from heater core. 2—If you use permanent-type anti-freeze, a "high-temperature thermostat" (open at 175 degrees) will deliver hotter water to your heater. 3—Blow "fluff" from heater's insides with a vacuum cleaner or, better, a trigger-type gas station air hose. 4—If heater motor is accessible, oil lightly and perhaps sandpaper commutator and check brushes. 5—Keep radiator filled to correct capacity at all times.

HOW TO KEEP DOORS WEATHER-TIGHT—Leave the doors of your car *only partly latched* when in the garage, thus letting rubber weather-stripping regain resiliency lost when doors are always kept tightly closed.

TOO MANY STICKERS—Don't clutter up your windshield with dangerous, vision-obscuring stickers. Parking lot permits, beach admission tags, golf course, club, factory, and other stickers can be *taped onto the front of your sun-visor* where they are easily displayed when necessary merely by pulling the visor down.

STOP FLATS BEFORE THEY START—*Whenever you add air, test your tires* by putting a drop of water in the valve stem (if no water is available, apply saliva). Bubbles indicate a "sneak leak" caused by a grain of dirt, forced into the valve during inflation, which may be dislodged by jiggling the valve pin; or by an improperly seated valve core, easy to tighten if you carry one of those old-fashioned deflator type valve caps that can also be used as a stem wrench; or by a faulty valve (when replacing, dip the new core in brake fluid or smear with soap to soften the rubber parts, making a tighter seal).

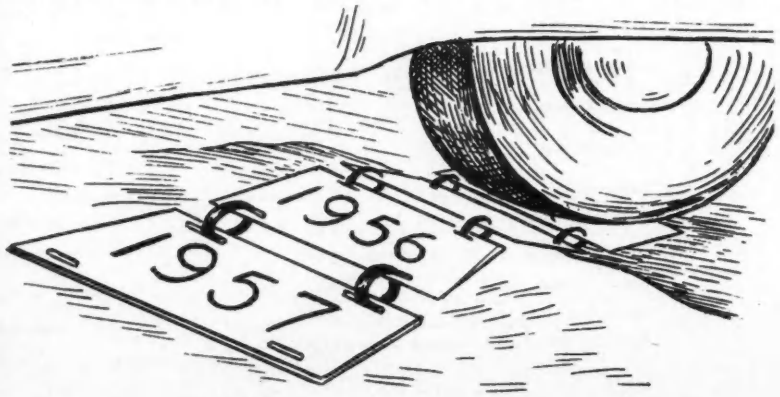
THAWING FROZEN LOCKS—When wet wintry weather freezes your car door or garage lock, *a hot water bottle held against the lock* should thaw it in a few minutes. Away from home you won't have a hot water bottle, but *holding a cigarette lighter or matches under the key* inserted in the lock



(being careful not to scorch the car's paint) will introduce heat *into* the mechanism for quick thawing (see sketch). A frozen lock indicates water in the cylinder which, to prevent further freezing, should be flushed out by squirting in cleaning fluid, working it around with the key. When dry, lubricate with graphite . . . never gum-forming oil.

NEW YEAR . . . NEW PLATES . . . NEW IDEAS—Keep your New Year license plates looking *new* ALL year by giving them a coating of wax or clear lacquer so that rust and road-salt won't spot or discolor them into looking out of place on your otherwise well-cared-for car. Before bolting new plates in place, insure against loss by painting on their backs "Please return to (your name and address). Postage will be paid."

Instead of throwing old plates away, link them to others with loops of heavy wire to provide a folding "tank-tread" that will roll you out of ruts and snowdrifts. (See sketch.)



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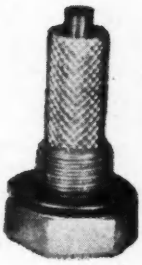
Remarkable results are being reported from all sections of the country—continued new-car performance for 50,000 miles or more.

KEEP YOUR ENGINE YOUNG & POWERFUL



$4.95

FOR YEARS we have known that sulphur and other impurities are found in even the best grades of regular and high-test gasoline. When the fuel is burned, tiny amounts of this sulphur and impurities are left behind to "blow-by" even the best and newest of piston rings into the engine oil. What happens next?

Some water moisture is always present in your crankcase oil. It combines with the sulphur and other trace impurities to form sulphuric acids, in measurable quantities. And then?

Attacking cylinder walls, pistons and bearings these acids—if left to accumulate in your engine oil—wear away the close tolerances originally built into finely machined engine parts. No engine ever made—not even the finest—can hope to escape the loss of power and compression that follows. Your own car, if over 6 months old, may already show the symptoms of this acid-caused damage in increased filter sludge and carbon sludge on piston crowns.

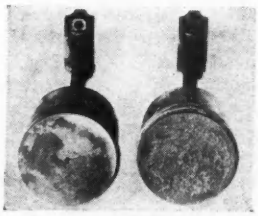
If so, here is how you can prevent it!

MAGNA-POWER STOPS ACID WEAR

With test results to show that an alkaline agent would neutralize the acids and inhibit sludge and carbon formation, the Johns Manufacturing Co. has prepared a special magnesium alloy drain plug called Magna-Power. Tests conducted by the Canadian National Research Council (Canada's Bureau of Standards) and the Southern Analytical Laboratory in Jacksonville, Fla., have found that this magnesium alloy (1) effectively neutralizes corrosive engine acids, (2) greatly inhibits the formation of sludges, gums and resins and (3) destroys catalysts that cause oil breakdown products which foul spark plugs and cause preignition and internal shorting. Further experiments showed that by attaching a powerful Alnico magnet to the plug many iron and steel filings in the drain pan could be removed.

(unretouched)

Filter and oil sample (left) from a car using a Magna-Power plug show less sludge and contaminants—both oil and filter are still clean. Filter and oil sample (right) from car without Magna-Power show normal heavy deposits at same mileage.



(unretouched)

Heavy carbon deposits are actually "baked" on the piston crown (right). Formation of carbon on piston (left) shows remarkable difference when resins are inhibited by Magna-Power. Build-up of carbon causes loss of power and increases oil.

HERE ARE THE BENEFITS

With reduced acid wear and sludge formation, you get increased power for quicker starting and faster pick-ups. Elimination of many harmful spark plug deposits mean smoother driving, longer spark plug life. Less sludge also means (according to the Canadian Research Council) that oil can be used well over 3,000 miles and filter life is often doubled.

Road tests also show that wear on pistons, rings, valves and other parts can be reduced BY AS MUCH AS 80%. This means a car may be driven well over 100,000 miles without an overhaul. Meanwhile the powerful magnet draws iron and steel filings out of the oil system.

Turn the page for some of the most significant and amazing endorsements ever accorded to any product made for cars.

(Advertisement)

WHAT USERS SAY:

LOWER MAINTENANCE COSTS

"I must write you about my Magna Power on my Packard Taxicab. I installed it when the car had 27,000 miles on it and the car now has 105,000 miles and is still going fine, runs very smooth and is not hard on oil yet. My spark plugs have over 60,000 miles on them and look good for that much more. My car has no work on it in all that time. I change oil every 8,000 miles and sometimes more."

L. W.
Tomahawk, Wisconsin

"After I put one of these on my former car a 1950 Studebaker Commander, I never touched the motor or even removed the head; and when I turned the car in (it had about 42,000 miles on it) I was getting a top speed of ten miles more per hour than I had been able to obtain before installation of your neutralizer. I would not operate a car without it."

E. G. F.
Erie, Pennsylvania

LONGER ENGINE LIFE

"Please rush me a Magna Power Plug for my new Nash Rambler, I had one in my Hudson and also my Plymouth and they are both running and in perfect shape. The Hudson has 90,000 miles or more and the Plymouth has 65,000, neither one has had the head off."

C. A. W.
Jefferson City, Mo.

"Enclosed is a money order for a Magna-Power plug for my 1956 Ford. I used one of your plugs in my 1955 Ford 6. I put 90,340 miles on the car, and the motor was as good as new when I traded it off."

J. A. W.
Terre Haute, Indiana

"May 7, 1953 you mailed me an Acid Neutralizer drain plug for my 1940 Dodge motor. This car was completely overhauled at 68,000 miles at which time the Magna-Power was installed; it was driven 70,000 miles after that and was using very little oil and had loads of power when traded in. It is still being driven at this time."

J. H. R.
Pomona, California

LESS OIL USAGE

"I have used Magna-Power drain plugs for over a year. I think they are the greatest. I used one in my old car—a 1953 Nash Ambassador, before I installed it the car used one quart of oil in 700 to 800 miles (50¢ H.D. oil). After installing, my wife and I made a trip from Denver, Colorado to Fort Bragg, N.C. Round trip plus lots of hard, fast driving, the car got between 20 to 22 miles to the gallon, and only used 1½ quarts of oil in better than 5,000 miles. I would like to put in an order for one for my new car, a 1955 Nash Ambassador V8. Please send one as soon as possible, because I hate to drive my car without one."

W. S. O.
Denver, Colorado

"I bought a 1953 Studebaker for which I bought a Magna-Power plug. I traded it in January 28, 1956 on a new Chevrolet Station Wagon. I drove the 1953 Studebaker 47,000 miles in 26 months and I still got 3,000 miles to a quart of oil. I changed oil at that time. I took a trip to Topeka, Kansas last September and I didn't change oil until I returned to L.A., approximately 5,000 miles. I used one quart on the trip. I am very pleased that I bought the Magna-Power plug. I believe it did wonders. I'd like one now for my Chevrolet V8 Station Wagon 1956."

M. H. B.
Los Angeles, Calif.

SPARK PLUGS LAST LONGER

"I am sending for my Magna-Power to put on our new car. We used our Magna-Power on our 1952 Oldsmobile and never had the spark plugs out after we put the Magna-Power plug in, almost 30,000 miles. When we traded it off, we were adding a quart of oil in about 3,000 miles."

C. R. D.
Boise, Idaho

"Put a Magna-Power plug in a 1950 Ford 6 with 50,000 miles on it. Installed a new set of plugs and points. At 90,000 miles I examined the plugs and I couldn't believe it. They looked like new. Hope you have a Magna-Power plug for my MG-TD."

K. R. C.
Jacksonville, Fla.

TRADE-IN VALUE HIGHER

"I have just traded my 1954 Ford for a 1957 model and am not wasting any time in ordering my Magna-Power plug. My car had 70,000 miles registered when I traded and can truthfully say I did not at any time burn any oil due to the Magna-Power oil plug and radiator insert. My car being above average in appearance and mechanically perfect brought me more than the book value. It was sold the same day for above the book value."

A. R.
New Rochelle, N. Y.

"Please send me a Magna-Power for a 1956 Mercury Montclair. Bought one a couple of years ago for a 1954 Mercury and I really got top trade in because the '54 ran so smooth."

R. A. P.
Edmond, Oklahoma

"Enclosed you will find my order for an acid neutralizer for my 1956 Ford. I used a Magna-Power neutralizer in my 1954 Ford which I drove 70,000 miles. I used only two sets of spark plugs during this mileage and after the plugs were cleaned during my periodic tune-ups, they tested almost as good as new. My gasoline mileage remained constantly good and the compression after 70,000 miles still checked out to new car specifications. The exceptionally good running condition of my car enabled me to get an unusually good trade-in price towards my 1956 car and the dealer sold my 1954 car within 24 hours after taking it in trade. I have been very enthusiastic in recommending your product to my friends and I certainly want to protect my new car with a Magna-Plug."

J. W. T.
Attleboro, Mass.

(Advertisement)

PERFORMANCE DATA FROM MAGNA-POWER USERS

'55 Volkswagen

Total engine miles	24,000
Total with Magna-Power	23,000
Spark plug life	24,000

User Comments: "Since installing your plug my spark plug set is still functioning well at 24,000 miles. 8,000 to 10,000 miles was my previous experience."

S. E. A.
Los Angeles, Calif.

'53 Plymouth

Total engine miles	22,400
Total with Magna-Power	14,000
Spark plug life	16,000

User Comments: "My mechanic is amazed that there is no grit on the dipstick whenever he checks the oil. I never change my oil except seasonally and even then it's not necessary. The spark plug mileage speaks for itself. The best investment I ever made."

M. F.
Brooklyn, N. Y.

'52 Buick

Total engine miles	48,000
Total with Magna-Power	48,000
Spark plug life	35,000

User Comments: "Changed plugs at 35,000 miles but doubt they needed it then. Still running with as much power as ever and not burning any extra oil."

H. J. A.
Modesto, Calif.

'53 Chevrolet

Total engine miles	46,924
Total with Magna-Power	21,924
Spark plug life	16,294

User Comments: "I still have the Chevrolet for which I bought the first Magna-Power. Believe it or not I get between 17 and 18 miles per gallon in the city and I still have the pickup that the car had when it was new. I have become one of your stanch boosters."

G. T. C.
Tampa, Florida

'53 Porsche America

Total engine miles	24,395
Total with Magna-Power	19,340
Spark plug life	18,000

User Comments: "Had frequent tune-ups before using Magna-Power, especially fouled plugs. Haven't had to take the plugs out in 18,000 miles. Engine runs like a clock."

E. C. D.
Mount Dora, Florida

'55 Ford Fairlane

Total engine miles	55,000
Total with Magna-Power	45,000
Spark plug life	5,000

User Comments: "After 55,000 miles I got 4,000-plus miles per quart of oil under any driving conditions. We're sold!"

E. E. L.
Toms River, N. J.

'54 Ford Country Sedan

Total engine miles	61,467
Total with Magna-Power	50,000
Spark plug life	40,000

User Comments: "Plugs installed at 20,000 miles and they are still going with two cleanings. As a result of the excellent way my car performed I got a top trade-in value on my new car—about $300 over average for the model year."

G. S. McE.
Decatur, Illinois

'53 Ford

Total engine miles	67,700
Total with Magna-Power	52,000
Spark plug life	8,000

User Comments. "I was using 1 quart of oil to 900 miles. After installing Magna plug, oil mileage went up to 2,000. Motor was operating perfectly at 67,700."

H. A.
E. Boundbrook, N. J.

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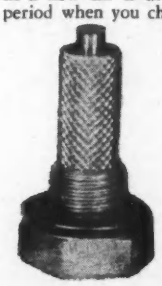
If Magna-Power can increase your car's useful life, maintain it's like-new performance and cut your costs of operation to a new low—isn't it worth the trial? We make no claims that are not substantiated by the successful experience of hundreds and thousands of car owners who have become satisfied users and endorsers of Magna-Power over the last few years.

WHY MAGNA-POWER IS NOT ORIGINAL EQUIPMENT

A new car, or one that has been rebuilt, should go through a break-in period. During the auto's first 1,000 miles rings are seated and the new engine, through a small amount of necessary wear, "loosens up" for maximum efficiency. The time to install Magna-Power in a new car is at the end of the break-in period when you change oil.



$4.95

'54 Ford

Total engine miles	68,490
Total with Magna-Power	63,490
Spark plug life	23,000

User Comments: "Your plug looks very good. Still getting almost 2,000 miles before adding a quart of oil. Points have been good for about 23,000 miles."

J. H. S.
East Hartford, Conn.

'53 Studebaker

Total engine miles	55,000
Total with Magna-Power	28,000
Spark plug life	28,000

User Comments: "Installed Magna-Power at 27,000 miles. Traded car at 55,000 miles with same spark plugs. When plug installed, car used I quart of oil in 2,000 miles. When traded, it used less."

F. H.
Cookeville, Tenn.

'52 Plymouth

Total engine miles	43,720
Total with Magna-Power	23,000
Spark plug life	23,000

User Comments: "I installed Magna-Power and new plugs at 19,000—never had plugs cleaned or gapped—sold car at 43,720 miles—had extreme pep and power—changed oil at 2,500 usually about 1 pint low—was averaging on road about 17.4 mpg—it's well worth the investment."

W. F. D.
Martinsville, Va.

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(Use Margin If Needed)

MAGNA-POWER CORP., Dept. M-1
Middlesex, N. J.

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Send me a Magna Power for my car on your 30-day FREE TRIAL. If I like Magna-Power, I will promptly send $4.95 (plus 25c postage and handling). Otherwise I will return Magna-Power and owe you nothing!

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Dept. MTC-1 • MILFORD, PA.

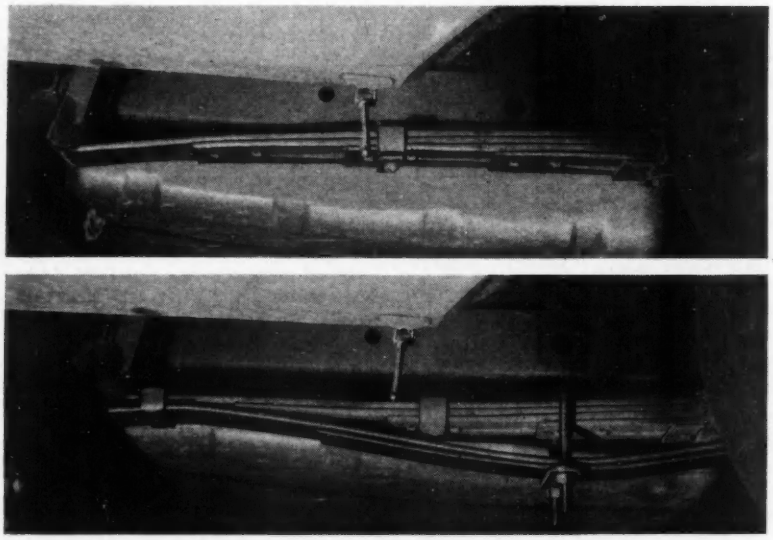
PRODUCT USE TEST

LAHER CANTILEVER BOOSTER SPRINGS

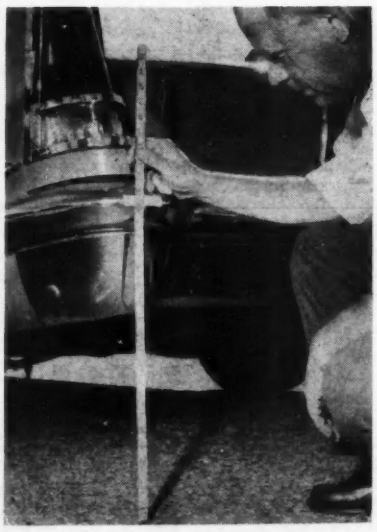
DETROIT HAS ALWAYS been hard pressed to keep you happy with the way your car rides. One of the toughest problems facing designers has been to find a means of giving you a uniform ride under all conditions. If, for example, you carry three husky adults in the back seat plus their luggage in the trunk, you may expect that your rear springs are going to be called upon to do a job just a little out of the ordinary. You probably will have to take it very easy when negotiating dips and bumps. The ride may feel soggy, and you may find your headlights tilted upward into the other fellow's eyes.

To check the results of just such a condition, we conducted an experiment with a Chrysler 300-C hardtop. First we drove the car unloaded to refamiliarize ourselves with its very fine ride. We then loaded the back seat with 403 pounds of ballast and the trunk with 217 pounds. At this point we found the rear bumper to be 2.5 inches closer to the ground than when the car was empty. This of course could have an unfavorable effect on headlight adjustment and could cause rear bumper contact with driveway ramps.

We were not surprised when we went for a ride in the heavily loaded car. The ride, as we expected, felt very soggy. We bottomed on sharp dips and driveway ramps and experienced a feeling quite alien to the car's usual stable feel in sharp corners.



REAR SPRING shown in top photo assumes reverse curvature under heavy load. Boosters shown installed in bottom photo stiffen and straighten the springs.

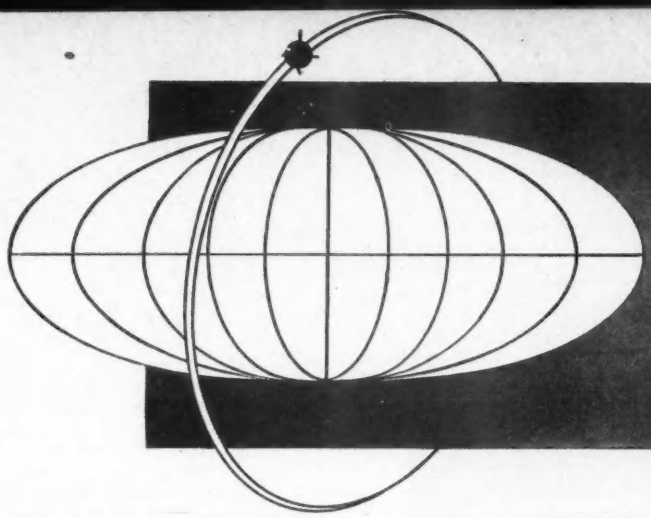


Our next move was to install a pair of Laher Cantilever Booster Springs. After the boosters were installed, we again measured and found we had raised the rear bumper slightly more than an inch. A test ride under these conditions quickly made us aware that the ride was even better than before the car was loaded and the boosters installed.

After removing the load, we tried another trip with the boosters in place. This time we found the ride to be a little firmer than normal but not by any means rough. It is possible that had we backed-off the nuts which secure the booster's U-bolts, we could have returned the ride to a normal condition.

We were quite convinced that the boosters are a very practical accessory even for the motorist who only occasionally carries a full load in the rear seat and trunk. /MT

HEIGHT OF CAR from ground under various load conditions was checked against an index mark at each side of the car on the rear bumper.



AROUND THE WORLD IN THIRTY DAYS

AMERICA IS NOT OVERRUN by imported autos. It only seems that way to the frustrated drivers of bulkier machinery who see them darting nimbly through traffic into spaces and through holes formerly reserved for motorcycles.

Seriously, the importance of imports can no longer be brushed aside—even by ultra-conservative Detroit manufacturers who have been carefully and quietly eyeing overseas developments since the close of World War II. If any proof is needed that imported autos have "arrived," check the import-export figures. During 1957, we imported more cars than we exported—an unheard-of situation in the history of U.S. auto making.

For a preview peek at some of the machinery which will shortly be reaching America, plus a look at some of the new models of current imports, we invite you on a 30-day round-the-world tour in the following pages.

The success which clothes small auto sales did not arrive full-blown. It followed a steady, though sometimes giddy, course. Consequently, there are logical reasons for the increasing sales of imports. George Romney, president of American Motors, recently predicted that small cars will comprise 10 per cent of the market by 1960. And that is a lot of cars—more than enough to create a kingsize traffic jam on anybody's freeway.

Initial cost is a factor, though not so critical as it might seem. The drive-away price of almost every small car in the economy class (don't confuse sports cars with small, economy machines) is only slightly less and in some cases equal to that of a low-cost Detroiter.

Reasons for purchase have become more fundamental and honest and, as a result, a sounder foundation for continued growth has been laid. Small cars are economical, both to operate and maintain. It's a real pleasure to pay a monthly gasoline bill which is half as large as the one built into a full-size car. (Not so strangely, Detroit is finally stressing fuel economy in the '58s.) And while you're burning less gas, you're doing it with driving ease, especially in heavy traffic.

Parts and service are no longer the problem they were for foreign car pioneers of the early '50s and maintenance problems have decreased in direct proportion.

Obviously, there must be disadvantages. It's difficult to find them out from the militantly enthusiastic owners, but we can reveal a few.

The small cars are underpowered and you have to shift gears. Well, some people enjoy shifting gears after they re-learn the knack. Underpowered? Yes, in comparison to the American V8s, but in order to achieve economy something has to give. In this case it's cubic inches and number of cylinders.

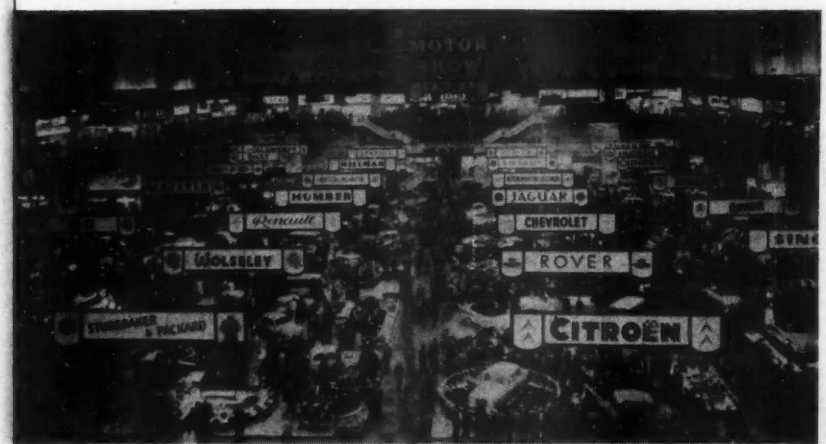
They lack space. Some do but step inside Volkswagen's Microbus and look around. The amount of room required in an automobile is purely a matter to be wrestled out with the purchaser's own conscience. For some, an Isetta 600 is ideal; for others, a Greyhound bus would be inadequate.

They ride uncomfortably. Short wheelbases do tend to create choppy rides, but the highly efficient suspension layouts on most makes ride well—unless you happen to want that gliding-through-a-sea-of-marshmallows feeling. And brother, that just ain't practical in the turns.

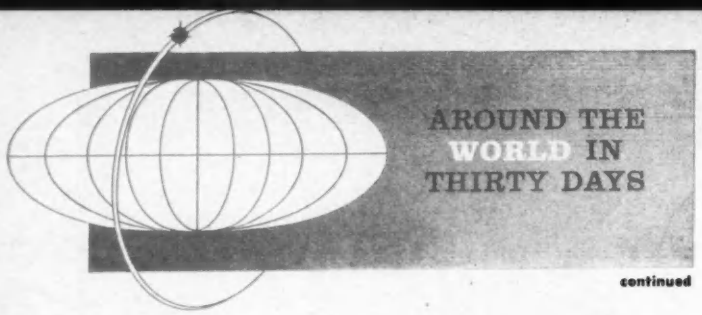
Because we feel that imported autos are no longer "cute little novelties," that they are influencing a whole new cycle in Detroit thinking which will eventually affect everyone who drives a car, import or domestic, we will take MOTOR TREND readers around the world of foreign cars every 30 days. And from the variety of cars being swung onto our shores from cargo holds on both coasts, there won't be many countries left out of the act.

So it's around the world for a sampling of a few of the new makes and models introduced at the latest shows. And away-y-y-y we go. . . .

—Wayne Thoms



AT EARLS COURT in London—and at other automobile shows in Turin, Paris and Frankfort—European car builders proudly unveil their latest automotive lines.



continued

by Gordon Wilkins
Overseas Correspondent

BMW
503 and 507

BMW 503 CONVERTIBLE

BMW 507 COUPE

Carrying on the tradition of fast sports cars from Munich, the BMW 507 is available as a two-seater coupe or convertible. A V8 engine of 193 cubic inches (3.22 x 2.95 inches) gives 150 bhp at 5000 rpm on a compression ratio of 7.8 to 1 with two dual-throat downdraft Solex carburetors. Overhead valves are pushrod operated. Transmission is through a four-speed, synchromesh gearbox in unit with the engine, controlled by a short central lever.

Chassis is an elegant piece of structural engineering, with box section side members and tubular crossmembers. Front suspension is by double wishbones and longitudinal torsion bars; rear by rigid axle with trailing arms, transverse Panhard rod and long torsion bars.

Bodywork is of light alloy, and the hood opens forward. Convertible is the standard type, with detachable hardtop as optional extra. Thus equipped, curb weight is 2820 pounds. Interior finish is excellent, but in strictly functional style.

The 503 has the same engine in a longer chassis carrying a four-seater coupe or convertible. General design is similar, but the gearbox is mounted separately from the engine in the center of the chassis. Gearshift is on steering column, but central lever is now available on demand. Engine has a 7.3 to 1 compression, giving 140 bhp and 163 pounds-feet of torque. Brakes have vacuum servo assistance.

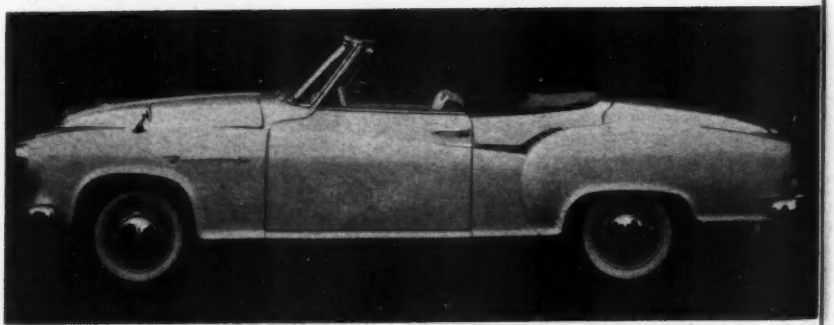
BORGWARD *Isabella*

The Borgward line, beginning with the 60-bhp Isabella, has progressed through the Touring-Sport, the TS deluxe, then the TS coupe, and recently at Frankfort, the Isabella TS convertible. All have unit construction and front suspension is by wishbones and coil springs with anti-roll bar, while rear end is swing axle independent. The 91-cubic-inch TS engine has an 8.1 to 1 compression ratio producing a respectable 75 bhp.

The coupe and convertible, beautifully finished, have deep separate front seats with fully reclining backrests.

A short run on a twisting road circuit showed it to be lively and smooth riding with an unusually precise steering column shift controlling a synchromesh gearbox. During fast cornering there is definite oversteer, and eventually the rear breaks loose, but recovery is rapid.

Factory claims include a maximum speed of 93 mph and fuel consumption of 25 mpg.



BORGWARD ISABELLA CONVERTIBLE

PHOTO BY GORDON WILKINS

PHOTO BY GORDON WILKINS

CITROEN ID-19 FOUR-DOOR SEDAN

CITROEN *ID-19*

When Citroën announced a cheaper version of the DS-19 a year ago, with the self-levelling suspension, but without the servo assistance for brakes, clutch, gearshift and other accessories, reaction was mixed. Now, a year later, the ID-19 is in regular production.

The engine, basically the same as that of the DS, has a single- instead of a dual-throat carburetor, dropping the power from 75 bhp to 66. Oddly enough this lower power does not seem to be reflected in any appreciable loss of performance.

Unassisted steering is heavier than average when parking, but when travelling fast, it is superbly accurate. I tried the car on the magnificent Montlhéry road circuit during the Paris Show and had the impression that I could have taken each corner faster than I did. The brakes are superb and apparently fade-proof.

The engine pulls well in top from about 25 mph, but the car really comes to life when the gearbox is used. I saw indicated tops of 31 mph in first, 53 in second, and 90 in third. In top the maximum indicated was about 93, but I would place the actual speed in the high 80s. The willing, rugged character of the car with its impeccable handling and superb ride will appeal to many enthusiastic drivers.

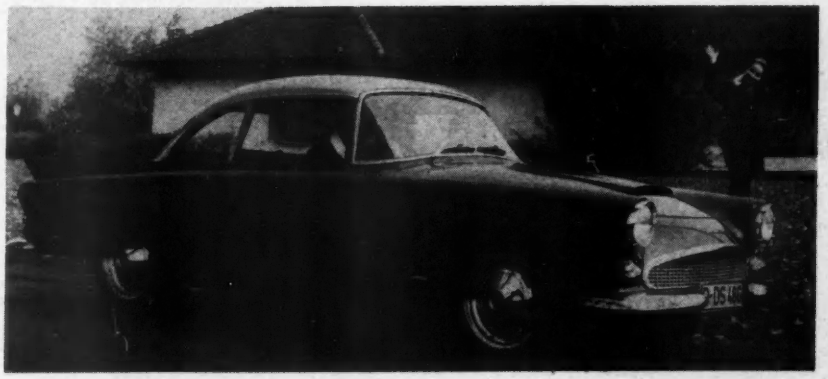
DKW *600 and* AUTO UNION *1000*

DKW 600 TWO-DOOR SEDAN

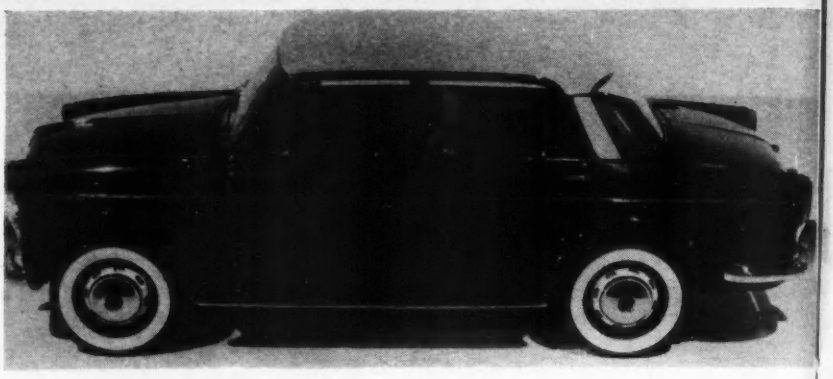
New for '58 from Germany's Auto Union factory is this beautifully styled DKW sport coupe. With its extended front fenders and canted-finned rear fenders, it takes on an Americanized appearance which should create U.S. appeal. It's powered by a 50-plus-horsepower, three-cylinder engine and will do about 90 mph. A scooped hood and much lowered mesh-type grille are featured. Interior trim and upholstery are a complement to its exterior styling. The front-wheel-drive vehicle undoubtedly will receive considerable interest on this side of the Atlantic.

DKW's new two-door sedan supplements the larger DKW (which remains essentially unchanged for '58). The "little" DKW is equipped with a two-cylinder, two-stroke engine with a displacement of 40.26 cubic inches. With a compression ratio of 7.25 to 1, its power output is about 30 bhp at 4200 rpm. The four-seater has independent suspension at front and rear with torsion bars, front wishbones, and telescopic shock absorbers. Production on this latter model is not expected to get underway until 1959, although the prototype is already being shown.

AUTO UNION 1000 SPORT COUPE



FIAT 1100, 1200 and 1200 Spyder



FIAT 1200 FOUR-DOOR SEDAN

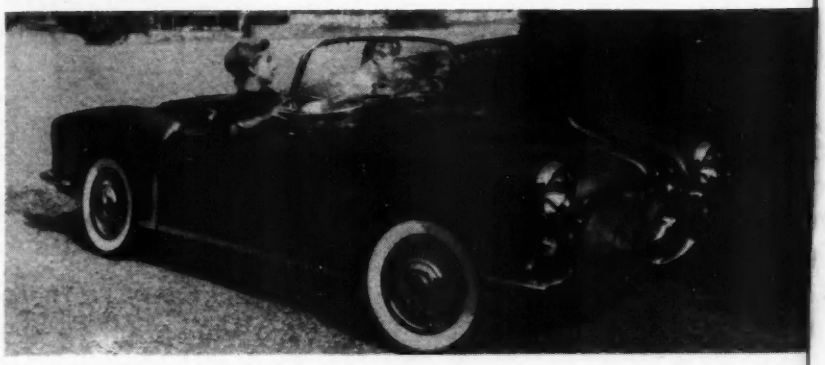
For 1958, the Fiat 1100 has been improved with more power, better brakes, and larger trunk. In addition there is a new 1200 Granluce, a hardtop, with a 74.5-cubic-inch engine developing 55 bhp.

The new 1100, known as the 103-D, has new grille and bumpers, bigger headlamps, but no longer a central foglamp. Rear window is larger, as on the TV model, and trunk capacity is up due to a 5½-inch increase in overall length. Interior revisions include a black steering wheel and black cowl over a ribbon-type speedometer. Pedals are larger, and the rear seat backrest is now fixed. There is a key-turn starter. Modified cylinder head, with separate intake ports to each cylinder, raises engine power from 40 bhp at 4400 rpm to 43 at 4800. Carburetor is now Solex instead of Weber. The gearbox has stronger synchromesh, and new brakes with self-centering shoes have 153 square inches of friction area, an increase of 48 per cent. Drums have paddle-type cooling fins.

The new 1200, which replaces the TV, has the same new mechanical features, and by increasing the bore from 2.67 to 2.83 inches, displacement is raised to 74.5 cubic inches. Compression ratio is 8 to 1, giving a useful 55 bhp at 5300 rpm. Fiat claims a maximum speed of 85 mph, with a possible 56 in third gear. The same engine now goes in the former 1100-TV convertible, to give a big jump in performance. This model also has revolving seats for easy entry, larger luggage locker, and floor-mounted shift lever. Economy is combined with a feeling of luxury.

FIAT 1100 FOUR-DOOR SEDAN

FIAT 1200 SPYDER



FORD of England

Ford of Dagenham has made many improvements throughout their line for 1958, including their popular Zephyr and Prefect models. The Prefect has new tail lamps and larger rear windows, while the interior has also been improved by a completely new dash treatment. Instruments are grouped in two dials in front of the driver, and there is a large lockable glove box.

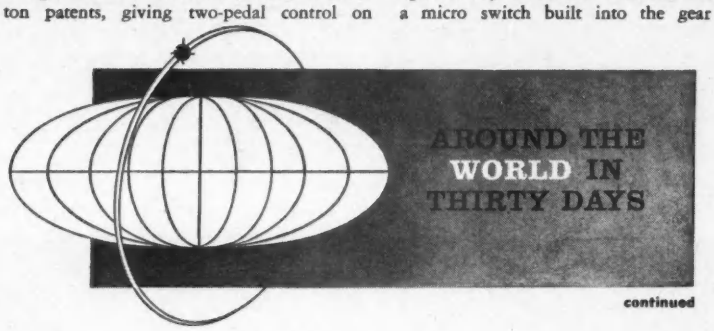
The grille on the Prefect is painted for standard models; chromium plated for deluxe, but all bumpers are now chromed. Grille on the Zephyr is new with more bars set closer together. Head linings are now washable plastic, rear seat construction is im-

FORD ZEPHYR FOUR-DOOR SEDAN

proved, and deluxe models have coat hooks.

Most important technical development is an optional automatic clutch, based on Newton patents, giving two-pedal control on both Anglia and Prefect. The centrifugal clutch utilizes a vacuum servo to disengage, operated by a solenoid valve controlled by a micro switch built into the gear lever. Putting a hand on the knob is enough to disengage the clutch. In the top of the gearbox is an inhibitor switch, so that the engine cannot be started in gear. Finally there is a tow-start device, operated by a small handle under the instrument panel, which allows the clutch to be locked up.

The Zephyr sedan has a new front seat frame and new seat cushions with combined springs and foam rubber, for greater comfort. Front seat center armrest is standard while rear seat center armrest is optional. On sedans and convertibles there is now a much neater gearshift which requires a more deliberate movement than the old one, but is very precise in action. Steering is by recirculating balls instead of worm and peg.



continued

GOGGOMOBIL

The new Goggomobil T-600, which will be in production about summer of 1958, is to have a two-cylinder, four-stroke, horizontally opposed engine of 35.86-cubic-inch displacement. With a compression ratio of 6.8 to 1, power output is rated at 25 bhp at 5000 rpm. Gas consumption is expected to be in the 40-48 mpg range, while top speed is 68 mph. Styled with modern lines, the new Goggomobil will have seating capacity for four passengers. Designed to give a comfortable ride, the car will have independent front suspension on wishbones and coil springs. A swinging half-axle is at rear. Hydraulic shocks are used at both the front and rear.

Although only in production as a producer of automobiles for the past two years, the German firm has created tremendous interest in their car on both sides of the Atlantic. You'll see more of this car.

PHOTO BY GUNTHER MOLTER

GOGGOMOBIL 600 TWO-DOOR SEDAN

GOLIATH 1100

GOLIATH 1100 COUPE

Up to this year the Goliath was the least known car of the Borgward group. It lacked the mass appeal of the little Lloyd, and never matched the performance or appearance of the Borgward Isabella. Early in 1957 the Goliath was entirely redesigned with a flat four-stroke four-cylinder 67.1-cubic-inch-engine driving the front wheels. The engine, mounted ahead of the front wheels, drives the four-speed synchromesh gearbox just behind the differential. Light alloy is used for crankcase, cylinder blocks and heads, with cast iron wet cylinder liners and inserted valve guides and seats. The engine is oversquare with bore and stroke of 2.89 x 2.50 inches.

The sophisticated sport coupe, introduced at the Frankfort Show, incorporates a unitized body with a tubular backbone. Front suspension employs a single transverse leaf spring, and a single wishbone at each side. At the rear is a rigid dead axle on half elliptic springs.

Engine in the coupe has 7.9 to 1 compression and two Solex downdraft carburetors, boosting output to 55 bhp at 5000 rpm compared to 40 bhp in the sedan.

Overall finish is luxurious; for example, the headlining of soft white perforated plastic is padded throughout for safety and sound absorption. There is also padding on the dash, but a row of seven identical unlabelled knobs presents a forbidding aspect to the driver who does not know the car.

The ride is reasonably soft, and there has been an overall improvement in ease of control since the car was first introduced. In particular, the steering, originally heavy, is now about the lightest I remember on a front-drive car. If driven to the limit, the front end will drift out on corners, but behavior seems consistent and safe.

The engine and transmission are smooth, and the gearbox is really sweet, with useful speeds of about 18 mph in first, 30 in second, and 55 mph in third. The makers claim a maximum speed of 84 mph, with safe highway cruising at 78-80 mph.

The coupe sells at a price directly competitive with the Karmann Ghia Volkswagen coupe, and it has advantages in performance and roadholding which should win it a place in the market for small sporting cars with style and comfort.

LOTUS *Elite*

Focal point of interest at the London Show was the revolutionary new plastic-bodied Lotus Elite Gran Turismo coupe. Main strength is obtained by using center tunnel and body sills as box section structural members, with shear panels taken forward into engine compartment, up to roof, and back into tail and luggage locker. A tubular steel reinforcement built into the cowl extends upward to form windshield posts, and there are two light sheet steel reinforcements connecting engine and suspension mounting points, with a transverse tube connecting top front suspension strut mountings. Otherwise, all attachments for mechanical units are bonded into the plastic.

Suspension is all independent, almost identical with that of the Formula 2 single-seater: front by wishbones (as on all current Lotus'), and coil spring shocks; rear by coils and swing axles, with the driveshaft forming one arm of a wishbone which locates the wheel.

The car is only 46 inches high to top of roof. Side windows are fixed except for windwings, but there is a built-in ventilation system with vents just above the rear window. Instruments grouped under a cowl in front of driver include speedometer, tachometer, ammeter, oil pressure gauge and thermometer. Doors have simple pushbutton latches, with no external handles. Two five-gallon fuel tanks are concealed in front fenders, and the battery is recessed in the left rear fender alongside the luggage compartment.

continued

PHOTO BY GORDON WILKINS

LOTUS ELITE GRAN TURISMO COUPE

Power unit is a new low-priced Coventry Climax four-cylinder, with single overhead camshaft, developed from the 1100cc racing engine, but with cast iron instead of aluminum block, and three-inch bore, giving a swept volume of 74.4 cubic inches. With a single SU carburetor, power output is 75 bhp at 6100 rpm, while dry weight is 1205 pounds. A maximum speed of 120-130 mph is expected. Girling disc brakes are used on all four wheels, those at rear being mounted inboard. A four-speed gearbox is remotely operated with a floor lever.

Production is expected to begin in the spring of 1958 and plans are to build up to 250 a year.

MERCEDES-BENZ *219, 220-S and 300*

More value at the same price is theme of improvements made to medium-sized Mercedes-Benz cars for 1958, while the Type 300, largest car in range, has been redesigned to bring it up to date in appearance and performance. The Type 180 gets an overhead camshaft engine of 115.7 cubic inches, instead of former side-valve unit. With 25 per cent boost in power, compression ratio is held at 6.8 to 1 to permit use of low-grade fuels. This also distinguishes it from the 190 which has more luxurious equipment, and 7.5 to 1 compression giving an extra 10 hp.

Detail improvements in the 180 include new upholstery, duo-tone door trim, and padded sun visors. New feature common to all models is a flexible mounting for Mercedes star on hood, which prevents injuries to pedestrians in case of accident.

On both 219 and 220-S, compression ratio is upped to 8.7 to 1, and a new camshaft is used to increase torque and improve acceleration. Optional on both cars is Hydrak automatic clutch, giving two-pedal control. This consists of fluid coupling, combined with single-plate clutch which is freed by a vacuum servo operated by contacts on gear lever during changing. A two-range defroster-blower, two-speed windshield wiper, and courtesy lights on front doors also are incorporated.

MERCEDES-BENZ 300 FOUR-DOOR SEDAN

Type 300 maintains classic styling in aristocratic tradition of Mercedes-Benz town carriage, but offers advantages of American four-door hardtop without usual center pillars. Wheelbase is lengthened by four inches to 120, permitting more legroom. Seats are softly upholstered in fabric, or in optional leather. Headlining is plastic. Front seat backrests are adjustable to complete reclining position. Rear window and trunk are larger and rear fenders have new taillights, direction indicators, spotlights, and backup lights. Curb weight is increased 190 pounds to 4400 total, but this is offset by increase in engine power and torque. Overhead camshaft engine size remains unchanged, but compression ratio is raised to 8.55 to 1 and Bosch fuel injection takes place of dual carburetors, raising the horsepower rating by 30 per cent to 180 bhp at 5500 rpm.

The 300-S and 300-SL sports engines have direct injection into combustion chambers; the 300 has indirect injection into inlet ports, but it is timed by the same type of Bosch pump.

The Borg-Warner torque converter, now standard equipment, is improved to give better acceleration. Rear axle ratio remains unchanged at 4.67; but to give extra acceleration for American conditions, a 5.11 to 1 axle goes on cars shipped to the U.S. Synchromesh box still can be had on order.

MOSKVITSCH 402

News about cars produced behind the Iron Curtain is sparse, but here is one that is currently being manufactured in Moscow. The new Moskvitsch 402 has modern lines and is powered by a four-cylinder, four-stroke engine of 74.42-cubic-inch displacement. Rated at about 40 bhp at 4200 rpm, engine is hooked up to a three-speed gearbox, with only second and third gears synchronized. Independent front suspension with coil springs and telescopic shock absorbers, and a rigid axle with semi-elliptic springs and shock absorbers at rear are featured. The four-door four-seater has top speed of 63 mph.

MOSKVITSCH 402 FOUR-DOOR SEDAN

RILEY

1.5 and 2.6

Two Rileys are offered for '58—a Two-Point-Six with a six-cylinder engine replacing a four-cylinder unit, and a One-Point-Five, which brings Riley back into the small high-performance car market. The Two-Point-Six has a BMC C-type engine of 160.98 cubic inches with two carburetors, giving 101 bhp; this is a lower power output than the former engine because it had twin camshafts, short pushrods, and hemispherical heads. New engine is smoother and gives higher torque at lower revs, resulting in better top-gear performance. A four-speed gearbox with top three gears synchronized is standard, while Borg-Warner overdrive is optional; also optional for first time on a Riley is Borg-Warner automatic torque converter transmission. Top speed of 100 mph is claimed. Lockheed brakes and leather-covered foam rubber roll on top of instrument panel are safety features. New body has greater appearance appeal than previous model. Wheel size has been reduced from 16 to 15 inches, but tires are larger with a 6.70-inch section.

The One-Point-Five, 1½-liter sedan is developed from the Wolseley 1500, using same basic structure, body panels, and engine; but it has more power, better finish, and some individual touches resulting in a better appearance. Its 90-cubic-inch, four-cylinder engine is close to that used in MGs; it has two carburetors and an 8.3 to 1 compression ratio, giving it 68 bhp at 5400 rpm.

On a short test drive, car responded easily and agreeably to controls and is safe to handle. It corners fast without excessive roll and handles well even on bumpy curves.

Upholstery is in two shades of leather; polished wood is used for dash panel and door moldings. Headlining and sun visor are plastic finished. Essentially a four-seater, floor gearshift presents no obstruction of any consequence. Rear seat headroom is not adequate for six-footers. Standard equipment includes pile carpets, heater, and windshield washer. With curb weight of 2060 pounds, car is built on an 86-inch wheelbase.

RILEY 2.6 FOUR-DOOR SEDAN

PHOTO BY GORDON WILKINS

RILEY 1.5 FOUR-DOOR SEDAN

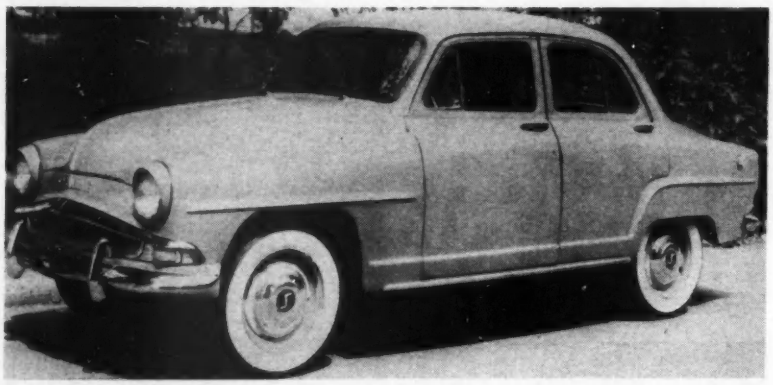
SIMCA CHAMBORD FOUR-DOOR SEDAN

SIMCA

Montlhery and Chambord

Latest addition to the Simca Aronde line is its Montlhéry four-door sedan. Prior to this year, it was only available in a sports convertible and hardtop models. Its four-cylinder, 78.69-cubic-inch engine develops 57 bhp at 5200 rpm. Optional is a Simca-matic, a semi-automatic transmission which eliminates the clutch pedal. With the standard three-speed gearbox or the optional transmission, a 40-mpg gas consumption is claimed.

The Vedette Chambord is offered in a four-door sedan and station wagon configuration. No drastic style changes have been made in keeping with the European practice of retaining design identity over a period of years. However, a wide selection of new colors and upholstery materials, "3D" adjustable seats, newly designed wheel discs, and perforated plastic soundproof insulation on hardtop models, are offered for 1958.



SIMCA MONTLHÉRY FOUR-DOOR SEDAN

STANDARD PENNANT FOUR-DOOR SEDAN

STANDARD

Standard Motor Co. presents two new models for '58—a small sedan called the Pennant, developed from the Ten, with more powerful engine and redesigned bodywork, and an economy version of the Vanguard, known as the Ensign, with smaller engine of 101.87 cubic inches.

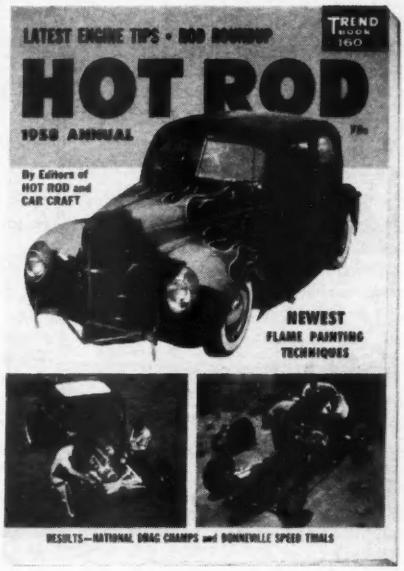
Pennant has a longer fender line, with hooded headlights, and a full-width grille. Rear fenders are lengthened and rear window is larger. Two-tone colors give sparkle to bodies. Power output of Pennant's four-cylinder engine is raised to 37 bhp at 5000 rpm, with compression ratio of 8 to 1. Gearshift is by floor lever; a Laycock-de Normanville overdrive is optional. Car weight is 33 pounds more than Ten.

STANDARD ENSIGN FOUR-DOOR SEDAN

The Standard Ensign has engine basically same as former Vanguard, but with bore reduced, resulting in smaller displacement of 101.87 cubic inches. With compression ratio of 8 to 1, power output is 60 bhp at 4000 rpm. Surprisingly, while cutting engine size, Standard has also cut engine revs, by switching axle ratio from 4.55 to 4.1; thus, emphasis is on economy rather than on acceleration. Ensign is distinguished from other Vanguard by a square-mesh grille.

For the U.S. market, a new model soon will be available. Known in Europe as the Standard Super Ten, it will have the higher-compression engine of the Pennant and other modifications, and will be sold under the name of Triumph.

THOSE TWO FAMOUS CAR ANNUALS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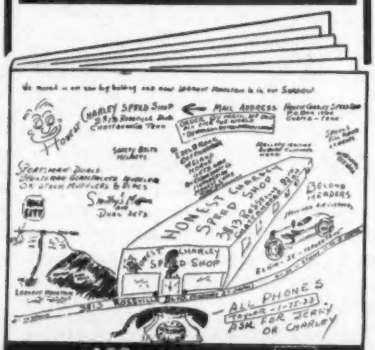

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questions from readers

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Q. *RESTORED CHRYSLER LE BARON. I have completely restored a 1932 Chrysler LeBaron convertible. Pictures are enclosed. I am advised that only one other exists (in California) and that it is valued at $2600. Would I be smarter to sell mine, or should I keep it, hoping it will increase in value? George Meuser.*

A. The car is rare but there are quite a few still in existence. We have seen nine or 10 in California alone and have received pictures of others in other states. Any classic is worth only that amount of money which an enthusiast will pay for it. You have a beautiful car, but its value to an enthusiast is greatly decreased because it is not original. The two-tone cream and red paint job, while beautiful to look at, is not original, nor is the black and white reupholstering job; the spare tire covers are not original and the large painted letter "M" on the tire covers detract from the car's appearance. It is difficult to say how much a collector would pay for this car. If it were ours we would not accept $1000 for it. We certainly doubt that it will bring $2600 in its present condition.

Q. *SWITCHING. Can truck tires (of the same size) be used successfully on a passenger car wheel? William Spence, Chatham, N.J.*

A. Yes and no. The situation is quite complicated. You don't mention any specific tire size, so let's use the 7.50 x 17 size as an example. Some passenger car wheels designed for use with this tire size will take truck tires, while others won't. If the wheel is more than five inches in width you can probably get by; if it is less than five inches, the thicker beads of the truck tire will pinch the tubes and you can count on at least one flat every 100 miles.

Most truck tires are eight-ply tires. They are exceedingly heavy and cause the car to ride like a truck. The same is true of six-ply truck tires. We have found the best solution to be one of improvisation: rather than use a 7:50 x 17 truck tire on a 17-inch wheel, we use a 7.00 x 17 tire. Though it is undersized, we have seen no troubles in the form of rapid wear or blowouts.

Q. *ELECTRONICS. Can you tell me if there is an electronic ignition system available? Jack Smith, Boise, Ida.*

A. Not at the moment—however, at least two manufacturers will probably offer it in their '59 line.

Q. *TACHOMETER. Is it possible to have a tachometer put on my '57 Olds? Do you suggest an electrical or mechanical type? J. F. Sparks, Kingston, Ont.*

A. Yes. We suggest an electrical unit which is easy to install. Write to Stewart-Warner, 1840 Diversy Park Way, Chicago 14, for specific model and price list.

Q. *NICKEL OR CHROME? My '24 Packard has nickel-plated headlights as well as other parts. Should I have them re-plated in nickel or chrome? Harold Brown, Cedar Rapids, Iowa.*

A. Nickel plating is, of course, original and if you are restoring to mint condition, you should have the parts re-nickeled. Nickel plating does not maintain its lustre nearly as long as chrome, is softer and requires greater care. It should never be cleaned with a solution containing a harsh abrasive.

Chrome is generally harder, lasts longer and does not require as much care as nickel. It looks better and is considered one of the few acceptable modifications in classic circles. If the car will not be in mint condition when restored, you will be better off to have the parts chrome plated.

Q. *REJUVENATING A CHEVY. Could I install a '57 Chevrolet engine in my '52 Chevy? How about the transmission? Robert W. Doney, Vera Cruz, Pa.*

A. Yes, it will go in. While you are going to this much trouble you will be better off to use the '57 stick-shift transmission too. One more word of advice: Be sure to rebuild the *rest* of the running gear—front end, steering, spring shackles, rear end and tires. Don't hook a lot of power to a junk heap.

Q. *CUSTOMIZING HUPP. I am customizing a 1934 Hupmobile. Is this car considered classic? I have installed 1938 Buick front fenders on it. Have you any suggestions for a grille? Lawrence Haddad, Birmingham, Ala.*

A. The Hupmobile is a special interest car and not a classic. See page 62 of the Nov. '57 MOTOR TREND. As for the customizing, you are off on the wrong track. Fins are much more modern and cheaper to install.

Q. *GOT THE BUG TOO. Everyone is always putting a late-model engine in an old car. I thought they were nuts, but now I have the bug too. I have checked new engine prices at local dealers and wonder how these guys afford an engine swap. Where can I get a late-model engine for something less than three months' salary? Robert Simms, Augusta, Ga.*

A. Try your local automobile wrecking yards. Offer to turn in your old engine and remove the new engine from the wreck yourself. We also suggest a want ad in your local paper requesting the engine of your choice.

Q. *STICKY VALVES. Nine months ago I stored a classic with an engine in perfect*

condition. I recently went to start it and all the valves are sticking. My confusion results because prior to storing it I had a complete valve job done. The mechanic refuses to do the job again because of the time that has passed. Do you agree that the valve grind was not properly done? Stephen Newman, Houston, Tex.

A. The valve grind may have been perfect, yet this situation could exist. Storage of an engine for a long period of time often results in this condition.

You don't mention the kind of a car you have, so we do not know whether it is equipped with hydraulic lifters or not. If it has hydraulic lifters, the oil may have leaked out of them, and careful driving for 200 or 300 miles may cure your trouble. If the car has mechanical lifters, run the engine at 500 to 600 rpm and when it is hot, run some good valve oil through the engine by pouring it slowly into the carburetor intake. A good upper cylinder or valve lubricator is also helpful in many cases. Finally, a good hard run of 100 miles at high speed will do wonders for sticky valves.

Once in a great while (and this usually shows up in one valve only) a piece of carbon gets between a valve stem and a valve guide, causing trouble. In rare instances valves may have to be removed and crocus cloth used on the stem, or the valve guides may need reaming. In this latter situation be careful that you do not remove too much metal—this would cause valve action to become sloppy, resulting in excessive oil consumption.

Q. *YES—BUT . . . Can I install a Laycock-de Normanville overdrive in my '50 Ford V8? F. Baumann, Chicago.*

A. It can be done, but we certainly don't recommend it. The labor involved is tremendous, and so is the cost.

Q. *SUPERCHARGING. I have an Italian-made supercharger designed for use on a Porsche. Can it be installed on a KA Lincoln? Eric Crouse, New York.*

A. It can be installed on the engine, but it will never work satisfactorily. The blower is designed for a smaller engine. The KA has a displacement so much greater than the Porsche that the blower could not possibly put out a sufficient volume of mixture under pressure.

Q. *CHANGING STEERING RATIO. Can I change the steering ratio on my '57 Olds Super with power steering? Where can I buy air lifts and flared fender skirts? H. L. Clark, McLean, Va.*

A. We don't recommend your changing the factory steering ratio. There is too much modification involved. Write Air Lift Co., 2330 W. Main St., Lansing, Mich., for your air lifts. Try J. C. Whitney & Co., 1917 Archer Ave., Chicago 16, for fender skirts.

It is impossible to answer any letters personally; we will answer the most interesting and most frequently asked questions in this column.

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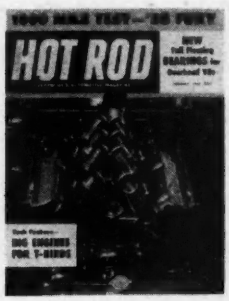

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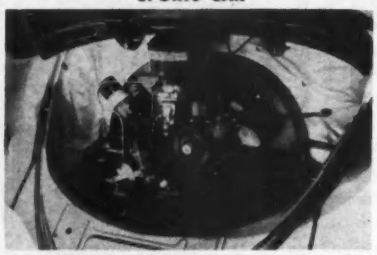


"V" BLANKET — SOUNDPROOF & BEAUTIFY engine compartment. Porsche & Ghia $16.95. Volkswagen $12.95. Colors: red, blue & black. Send for free accessory list—many items for all SPORTS CARS.

CALIF. SPORT CARS — ACCESSORIES
Dept. T, 10838 W. Washington Blvd.
Culver City, Calif.
in Calif. add 4% sales tax

STANDARD BB'S AND DARTS

Shoots like an air gun but this hard-shooting pistol uses powder caps to fire ammunition. For target shooting, plinking or pests. Fun for entire family. 8½" overall. Made of Styrene and steel. Comes with supply of BB's and darts. Money back guarantee. At sports dealers or write:

WAMO MFG CO., Box 61-C, San Gabriel, Calif.

NEW EASY WAY TO BECOME A TOP PAY

AUTO MECHANIC

The auto industry is short 100,000 mechanics! You can earn top pay, work steady, enjoy lifetime security in this big field. Let CTI train you at home in spare time. *We send valuable Engine Tune-Up Kit and Mechanic's Tools at no extra cost.* You get experience while training, earn money in spare time. Diesel or Body-Fender instruction included. *Write for Catalog today.*

Commercial Trades Institute, Dept. A-696
1400 Greenleaf Ave.—Chicago 26, Illinois
Send free book *Big Money in Auto Mechanics.*
Name _____ Age _____
Address _____
City _____ Zone _____ State _____

ELECTROPLATE *any object*

NOW with our **NEW ELECTRO-CHEMICAL** Outfit. You can easily do your own plating. Not a paint. But a hard durable metal plate, equal to commercial plating. Get your own plating kit with instructions on plating metal and non-metal objects as Tools, Auto Parts, Silverware, Jewelry, Baby Shoes and 1001 other articles with Chrome, Nickel, Copper, Gold, etc. **SEND NO MONEY.** Everything sent C.O.D. for the low price of ONLY $5.95 or send $5.95 now and receive it postpaid. Money back in 7 days if not satisfied. **M.Z. SALES CO.**, Dept. HR-5, 113 West 42nd St., New York 36, N.Y.

FREE OUTFIT STARTS YOU IN **BIG MONEY SHOE BUSINESS!**

Run your own profitable 'shoe store' business **from home!** Represent fast growing million dollar firm in spare or full time. We give you—**FREE**—complete Starting Outfit that makes you **$217.00 EXTRA each month for just 2 easy orders a day.** You feature 195 fast-selling dress, sport, work shoe styles for men and women. Air-cushion shoes, many other special features! Sizes 2½-15—widths AAAA to EEEE. Draw on 200,000 pair stock. Also horsehide jackets. Start now selling to friends, folks where you work. Rush postcard for FREE Outfit!

MASON SHOE, Dept. A-27, CHIPPEWA FALLS, WIS.

'58s BUILT BETTER?

continued from page 65

ting Detroit each year with complaints about faulty new transportation.

Surprisingly there's a candle in the window of every American automobile maker; for you actually do him a service by bringing faulty operation of a new car to his attention.

Here's how. And why.

When problems arise with your new car, try getting along with the dealer. Tell him exactly what you want, and insist he do it unless a reasonable explanation is presented as to why it cannot be done. Should you not be satisfied, write or telephone the local (Zone, District or Regional) office of the maker. Explain your troubles to the factory service manager and follow his advice. He is paid to keep you in the market for next year's model, and accordingly is more interested in your ultimate satisfaction than anyone else. Later, if you still feel unjustly treated write the factory a detailed letter and give them time to act.

What this accomplishes is multifold.

First off, by insisting the dealer repair a faulty part, paperwork has begun to flow factoryward telling of your problems. If the volume of customer complaints (such as yours) on any one part of the car exceed the expected average, some engineer had better have a pretty good story ready for the boss. Secondly, after you contacted the factory service manager, another piece of paperwork began its trip to Detroit. This one concerned the dealer. When any company begins to receive complaints on one dealer, far exceeding the average of all dealers, they rush a service team to the dealer's shop. His mechanics are retrained in proper service techniques and the dealer is given a few polite pointers on the customers (and dealerships) lost through poor service. Your "last ditch" letter to the factory starts another operation. It's a three-pronged attack on poor quality through frequent totals of specific parts complaints, how "X" dealership is servicing customers and how "Y" District is satisfying unhappy owners.

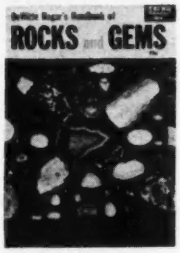
Most important, every factory insists that positive action be taken on your last ditch letter. They actually follow complaints to the point where you are either happy with their car, or have purchased another make.

To bring you the true picture of cars and complaints we interviewed factory service managers in the Detroit headquarters of nearly every corporation. We had letters our readers have written both MOTOR TREND and the factory, asked to see—and were shown the service file on each letter. The astounding information unfolded before us was recorded for a succeeding issue where for the first time we'll detail what happened WHEN YOU WROTE DETROIT. /MT

Hitting a New High in Hobbies—These Great . . .

TREND BOOKS

ON SALE NOW!



ROCKS & GEMS

There's fun and profit for you with this exciting hobby that's numbering more and more fans every day. ROCKS AND GEMS tells you all you need to know on how to cut, polish and display stones. You can earn $$, too, by transforming these stones into attractive pieces of jewelry. ROCKS AND GEMS covers the most popular stones, including beach stones, agates and flower stones. The bonus feature of the book is a big state-by-state locator guide, telling where you can find all the hard-to-get ones. ROCKS AND GEMS makes a fine reference; an especially good book for beginners.

COMING SOON!

How to Shoot and Edit

HOME MOVIES

Learn how to make home movies better—cheaper. You'll find easy-to-follow instructions on shooting techniques, cameras and lenses, equipment limitations, lighting and exposures, script planning and pre-editing, camera tricks and effects, titling, splicing and editing. Especially interesting is the unique, money-saving technique of "double shooting," which uses inexpensive 8 mm. film in place of 16 mm. There's a profitable side to this manual, too: sections on commercial film production and home movie marketing show you how to make your pictures pay off handsomely.

ONLY 75c AT NEWSSTANDS!

Or Send 85c *(to cover postage & handling)* to:

TREND BOOKS
5959 Hollywood Blvd., Los Angeles 28, Calif.

SATISFACTION GUARANTEED or your MONEY BACK JC WHITNEY

Changeover Motor Mounts

Specially Designed Motor Mounts Used When Installing Conversion Engines. Otherwise Chevrolet V8 Engines in 37-53 Ford and 49-53 Mercury.

Bolt to original stock mounts—heavy gauge steel—Complete, with all necessary bolts.

For Installing the Following Engines in Ford and Mercury 37-48.

Type of Engine	Stk. No.	Each
Ford	910	$17.50
Olds.	912	17.50
Chrysler	914	17.50
Chev. V8 92A	916	19.50

For Installing the Following Engines in Ford and Mercury 49-53.

Type of Engine	Stk. No.	Each
Ford	910	$17.50
Olds.	912	17.50
Chrysler	914	17.50
Chev. V8 94A	916	19.50

For Installing the Following Engines in Mercury 49-53.

Type of Engine	Stk. No.	Each
Ford	910	$17.50
Olds.	912	17.50
Chrysler	914	17.50
Chev. V8 92A	916	19.50

For Installing the Following Engines in Mercury 49-53.

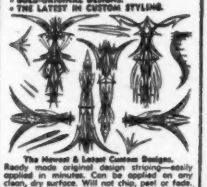
Type of Engine	Stk. No.	Each
Ford	910	$17.50
Olds.	912	17.50
Chrysler	914	17.50
Chev. V8 92A	916	19.50

For Installing the Following Engines in Mercury 49-53.

Type of Engine	Stk. No.	Each
Ford	910	$17.50
Olds.	912	17.50
Chrysler	914	17.50
Chev. V8 92A	916	19.50

PIN STRIPING

- BOLD-ORIGINAL DESIGNS.
- THE LATEST IN CUSTOM STYLING.



The Newest & Latest Custom Designs.

Ready-made original design striping—easily applied in minutes. Can be applied on any clean, dry surface. Will not chip, peel or fade. Kit contains fifteen decals in nine different designs, up to 6½" long. Eight colors to choose from: Red, white gold, black, powder blue, dark blue, light green and dark green. One kit will stripe an entire car, fenders, trunk lid, hood, skirts and other parts. Specify color when ordering.

Color	Color	No. 225—
Red	Powder Blue	POSTPAID
White	Dark Blue	
Gold	Light Green	$1.49
Black	Dark Green	

LATEST EXCITING DECALS

The Fiery-Faced Devil with Gal-loping Pitchfork.

Large 9"x18" size decal. Easily applied to any smooth surface.

2 Fiery-faced Devils in Red and Black colors with Dice. Easily applied to any smooth surface. Will not chip or peel. Use on doors, hood, fenders, trunk, skirts, etc. Specify color. No. 12—Devil Design, per sheet $1.19

Flame, Spider Decals

J
Small Spider in white, red & black; size 3½x4½" No. 227

G
Large Spider in white, red & black; size 5½x5½" POSTPAID

L
Flame in red in white; size 3½x5½" —Each 80c

Jumbo Chrome Monograms

Light distinctive bright chrome initials on an ebony plastic background. Gives a distinctive personalized look to the car.

Can be mounted on any flat surface. Adhesive backing holds and stays on indefinitely. Furnished in all initials A through Z—specify initials when ordering.
No. 282 —POSTPAID ..... 2 FOR $1.00

Volkswagen Owner's Hand Book

For Repair And Maintenance

Here's a book every Volkswagen owner & prospective owner will want—over 144 pages with 150 illustrations giving full details on tuning and servicing the VW, in non-technical language. A must for every VW owner and mechanic.
No. 910—Each POSTPAID $2.00

Renault (Dauphine) Owner's Hand Book

No. 33 —Each POSTPAID $3.00

AUTO FABRIC SPRAY

For a new looking car interior. Brightens and freshens faded and soiled fabrics. 12 oz. pressurized can sprays on headliners, door panels, and floor covering. Does not rub or fade. Can be dyed to match interior. Choice of red, rust, brown, tan, dark and light green, dark and light blue, dark and light gray, yellow, maroon, black and white.

Specify color when ordering.

No. 56, POSTPAID $2.95

MELLOW TONE MUFFLERS

Fiber Glass Packed

Increases horsepower, increases gas mileage, straight-thru construction, no back pressure, no high pitch irritating noises, deep powerful resonant tone. Specify make and model of car.
Each $4.95
No. 2— 2 FOR $9.89

CONVERTIBLE RAINCOAT

Quick, Slip-On Protection in Any Kind Of Weather for Convertibles.

Attractive plastic cover protects top or interior from dirt, dust, fog, rain, snow and other elements. Saves all wear and tear on expensive fabric tops. Quick, sure, easy, inexpensive protection with one-minute installation. Built to last, with extra tightening edges, and snaps. Fits all standard model convertibles. Can be used when top is up or down. Also handy as a cover for pleat pans, small boats, furniture, baby carriages and many other items. Furnished in plastic bag for storage.
No. 274 —Each $5.95

FOR ALL CARS INCLUDING 1958

Factory Duplicate — Custom Fit

FENDER WELL FENDER SKIRTS

FITS INSIDE AND FLUSH WITH FENDER

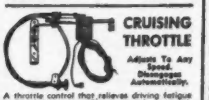
- Same as original equipment
- Perfect fit.
- Prime finish.
- Heavy Gauge steel.
- Locking lower handles.

SPECIFY YEAR, MAKE & MODEL

Stk.No.	Make	Type of Bottom	Pair
287—	50-53 All	Plain	$13.95
287—	54-56 Super & Roadmaster	Plain	13.95
287—	54-55 4 dr. Sed.	Plain	13.95
317—	54-55 Super & 70 Riviera, 4 Dr. Models	Plain	16.95
316—	54-56 Special & Cent. Fits Large Opening only	Flared	16.50
316—	1957—All	Flared	16.50
	CHEVROLET		
286—	49-52 All	Plain	11.95
286—	53-56 All	Flared	11.95
	DODGE		
287—	53-56 All	Flared	12.95
287—	56-58 All	Plain	12.95
	DE SOTO, CHRYSLER		
316—	57-58 All	Flared	12.95
287—	57-58 All	Plain	12.95
	FORD		
285—	52-56 All	Flared	10.95
285—	57-58 All	Flared	11.95
285—	57-58 All	Plain	10.95
	MERCURY		
303—	52-54 All	Flared	10.95
303—	55-58 All	Flared	11.95
	OLDSMOBILE		
315—	54-55 Model 98 Holiday Coupe	Flared	14.95
315—	1955 Model 98	Flared	14.95
315—	1956 All, 57 88	Flared	14.95
	PLYMOUTH		
306—	53-56 All	Flared	11.95
307—	56-58 All	Flared	12.95
307—	57-58 All	Plain	12.95
	PONTIAC		
307—	49-52 All	Flared	12.95
306—	1957 Sta. Wag. All Mod.	Flared	12.95
307—	1957 All	Flared	12.95

CRUISING THROTTLE

Adjusts To Any Speed. Disengages Automatically.



A throttle control that relieves driving fatigue and ends leg cramps. Preset rate of speed with handy dash control. Use accelerator for increasing speed—take foot off of accelerator and car resumes preset speed. Disengages automatically when brake pedal is touched. Handy for idling cold motors. Easy custom installation on the following cars: All V8 Buick, Cadillac, Chevrolet, Chrysler, DeSoto, Dodge, Ford, Kaiser, Oldsmobile, Plymouth, Pontiac, Six Cyl. Chrysler, DeSoto, Dodge, & Plymouth. Furnished in 6 and 12 volt. Specify year, car and 6 or 12 volt when ordering.
No. 288 —6 Volt Each $4.95
—12 Volt Each

NIGHT-GLO LUMINOUS CAR PLAQUE

When Struck By A Light Beam They Produce A Brilliant Red Or Silver Luminous Glow. Distinctive, eye-catching designs. Stippled black background with deeply embossed figure and lettering in red or silver luminous reflective finish. Made from heavy cast aluminum, size 9"x5". Easy to mount.

Sinners		Angels	
No. A	—Red	No. E	—Red
No. B	—Silver	No. F	—Silver
Race Masters		Jokers	
No. C	—Red	No. H	—Red
No. D	—Silver	No. I	—Silver
Rod Aces		Stockers	
No. J	—Red	No. M	—Red
No. K	—Silver	No. N	—Silver
Dragons		Wolves	
No. G	—Red	No. R	—Red
No. H	—Silver	No. S	—Silver
Road Kelpies		Road Rovers	
No. J	—Red	No. X	—Red
No. K	—Silver	No. Y	—Silver

All Same Price.
No. 67 Each $3.98

PLAQUE MOUNTING KIT

Makes the mounting of plaques a quick and easy job. Two sets of cable clamps and chain 6-4 chrome plated hooks. Can be adjusted to any length by opening or lowering hooks.
No. 1— POSTPAID
For Car $1.00

HI-FI CUSTOM TAILORED REAR RADIO SPEAKERS

With Tweeter And Woofer For True High And Low Frequency Fidelity In Bass And Treble Tones. Increases Response To A Range Of 30 to 15,000 Cycles. Complete With The Heavy Fader Switch To Control Volume From Either Front Or Rear Speaker.

Now you can add High Fidelity tone to your car radio. Hear music as you have never been able to hear it in your car before. With this new Hi-Fi speaker you will enjoy a completely new listening pleasure. Custom tailored to fit, with all necessary wiring and instructions. So simple to install that only a screwdriver is necessary. No cutting, no soldering, all wires are preasoldered. When ordering specify make, year and model of car, also specify make of radio and if push-button or not

Speaker Kit with Gray Plastic Grille		Speaker Kit with Chrome Grille	
Spkr. Size	POSTAGE Each	Spkr. Size	POSTAGE Each
5x7 No. 764	$8.25	5x7 No. 766	$8.50
6x9 No. 765	9.35	6x9 No. 767	9.90

HI-FI RADIO SPEAKER ONLY—With Tweeter and Woofer for true Fidelity in high or low frequency. For replacement of regular speaker in front auto radio or rear seat

Spkr. size—5x7	No. 778 POSTPAID	$8.25
Spkr. size—6x9	No. 779 POSTPAID	$9.35

Stewart Warner Ammeter and Oil Pressure Unit

For All Cars

A much needed addition to the warning lights provided on many cars.

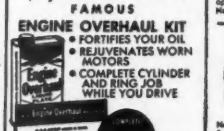
Warning lights indicate whether or not the generator is working or when oil pressure falls below 15 lbs., rather than the exact rate of charge or discharge and exact oil pressure. These calibrated gauges shows exact condition so that any faults can be remedied at once. Both gauges mounted in a single panel that can be mounted under dash or any flat surface.
No. 282— Kit $8.40

Stop BURNING OIL!

FAMOUS

ENGINE OVERHAUL KIT

- FORTIFIES YOUR OIL
- REJUVENATES WORN MOTORS
- COMPLETE CYLINDER AND RING JOB WHILE YOU DRIVE



$4.95

Reg. $7.00 value

Do-it-yourself in 10 minutes! Save on repairs. Simply drop Pellets into plug openings, pour Liquid Plate in oil. This potent combination rebuilds your motor while you drive. Good for 10,000 miles.
No. 125—POSTPAID $4.95

Chem-Chrome

Refinishes rusted, pealed or worn off Chrome to Metals the Original Brilliance.

- An Amazing New Do-It-Yourself Process.
- Gives A Reflective Chrome-Like Finish.

With this new finishing process rusted, pealed or worn chrome can be refinished to a brilliant lustre to match the original finish. No need to have shabby chrome on the car or spend a large amount of money to have parts re-chromed. With Chrome these parts can be refinished to their original lustre. Not a paint—not a sleaner. Each kit contains all the necessary material and easy to follow instructions—nothing to refinish an entire car. Can be applied on metal, wood, rubber, plastic or any combination of fields. Save, don't replace or plated. Rubber and plastic items can be finished easily. Straightens the exhaust tips. will bend. Withstands extreme heat or cold Handy for any item in the home such as hardware, plumbing, lamps, etc.
No. 166—Kit $4.95

New Style Headlight Shield

Contoured Shield Reflects and Intensifies the Light Downward.

Choice of Silver or Gold Finish

Contoured shield reflects and intensifies light downward. Gives greater, concentrated lighting, dresses up the front of car. Fits all sealed beam headlights—easily installed under rim. In beautiful satin silver or gold finish.
No. 134—SILVER Per Pair $1.75
No. 135—GOLD Per Pair

Easily installed on all cars without special tools.

Electronic conversion kit that makes your stock horns yodel like an Italian Bus. Splits stock horn sound into two resonating tones—one low—about 10 times a second—wherever you hit your horn. Completely automatic. Just 3 simple wire connections. Can be changed from car to car.
State—6 or 12 Volts.
No. 408—POSTPAID ..... Each $6.95

Stewart-Warner Hand Tachometer

An easy to use and accurate tool for measuring rotary speeds. Checks machinery and equipment for proper speeds so that maximum efficiency is obtained. Can be used clockwise or counter-clockwise. Large 2" easy to read dial. Checks speeds up to 4000 RPM. Complete with cone and cup shaped tips for all applications.
No. 43373—Each $11.60

HI-SPEED ELECTRIC SIREN

Developed especially for Police and Fire Chief & police departments, Scouts, ambulances, etc. Complete with bracket, screws, 10 ft. of cable & push button. Green Enamel.

No. 71—POSTPAID.	
6 VOLT, Each	$13.24
No. 91—POSTPAID.	
12 VOLT, Each	$13.70

Overhead Inside Mirror Bracket

For 1957 Plymouth, Dodge, Dodge & Chrysler

Improves Rear Vision 200%

A special designed bracket that attaches to top windshield moulding, removes center moulding screw and attach bracket than move mirror to bracket. Complete with mirror & bracket. Gray satin finish.
No. 11 —Each ..... POSTPAID $1.50

PLASTIC STEEL

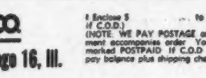
80% STEEL—20% PLASTIC

APPLIES LIKE PUTTY—HARDENS LIKE STEEL

ADHERES TO ALL METALS AND GLASS. Can be worked like putty—saw, grind, drill, etc. Repairs breaks, cracks, holes, etc.

A new material with unlimited uses. Can be used in repairing, remodeling or customizing. Apply like putty with any flat item and allow to harden. Can be sawed like steel grind, cut, drill, tap, etc. Can also be used as a bonding agent between two metals.
Each kit contains enough material for many applications. Instructions included.
No. 910—For Kit POSTPAID $2.25

NEW EXHAUST CUT-OUT



Exhaust tone is controlled from the dash. Can be used as a cut out in the country & closed in restricted areas. Or may be used to separate two different sized tuned mufflers. Well constructed of heavy plate steel. Straightens the exhaust pipe.
No. 46—For All Exhaust Pipes thru 2"
No. 318—For All Exhaust Pipes 2½" thru 2½"
POSTPAID Each $2.89

METAL MENDER

For Fast, Easy, Guaranteed Auto Body Repairs

Used for filling dents, holes, and all other metal repairs. Can be used on an actual weld on any solid material except cast iron, glass, concrete, etc. Will not shrink or crack out. Dries slowly allowing plenty of time for changes, forming and smoothing, or will dry in 5 minutes under a heat lamp. Easy to use, simply mix the two ingredients to form a putty-like compound that is easy to apply and shape. New two pack makes it easy to measure equal amounts —can be stored, will not harden until mixed. Contains material to cover one square foot of surface.
No. 303—Per Kit $7.95

DOOR HANDLE GUARDS

FOR ALL CARS

Tu-Tone, Flight Design

Protects the door finish around the handle from unsightly finger nail and ring scratches, also covers existing marks and protects against new scratches

Push Button Door Handle Guard

Swing or Lift Door Handle Guard

The exciting chrome and gold color Tu-Tone Flight Design harmonizes with the lines of today's cars—they add lasting distinctive beauty to any car. Made from durable Mylar—unusual rust and is flexible to fit door contours on any car. Easily attached without removing door handle—no drilling—no screws required. Complete installation instructions furnished.
No. 16—Per Kit $1.49
Postpaid.

MINI Super CHARGER

MiniSuperCharger consists of a revolving impeller "blower" and automatic "breather" valve which mixes an increased volume of air to the fuel charge with whirlwind force. This atomizes and expands the gas molecules so that the improved mixture enters the cylinders in a more powerful highly explosive state. The MiniSuperCharger eliminates over-rich mixtures and fuel waste. Better, cleaner combustion is obtained resulting in reduced "carry" over, less oil dilution, less valve troubles and longer engine life. Eliminates "Vapor Lock." Precision built of bronze and aluminum. Easily installed. Satisfaction Guaranteed.

Specify year, make, model of car or truck when ordering and model of engine.

No. 311—Single Throat Carb. Postpaid	$ 9.95
No. 312—Double Throat Carb. Postpaid	12.95
No. 313—Four Throat Carb. Postpaid	15.95

Increase Load Capacity 750 to 1500 Lbs. With

Quick Change HELPER SPRINGS

750 to 1500 lbs. Extra Load Capacity For Cars, ½ & ¾ Ton Trucks. Will not break the springs or your car or truck. Extra leaves give extra strength for heavy duty use. Once on they can be installed or removed in a jiffy. For all Cars, except Buick, ½ & ¾ ton pick-up trucks. No drilling necessary. Complete with "U" bolts, special center bolts, lowering and leaf blade when ordering.

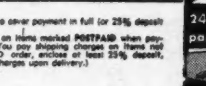
No.	Extra Load Capacity	PAIR
398-	750 lb. Extra Capacity.	$ 9.95
399-	1000 lb. Extra Capacity.	12.95
600-	1500 lb. Extra Capacity.	14.75

Hi-Speed, Hi-Power Rebuilt RACING and HOT ROD CARBURETOR

Chandler Grove 94A—3 Bolt Dual Throat Carburetor (Replaces Rochester 4-Barrel). Acceleration — Hi-Speed or Ten Speeds — The Performance.

Fits all 3 bolt dual throat manifolds—these rebuilt Chandler Grove Model 94 carburetors will replace those hard to get 97 Ford Streamliners and other hard to get cars. They are built and are redesigned with special high speed jets to give you the ultimate in performance.
No. 306—Each $9.95

MANUAL TRUNK KIT



Streamlines rear deck lid. Remove present handle, operate from inside of car. Complete with instructions and all parts to install.
No. 304—Fits Ford 36-55, Merc. 39-55, Chev., Buick, Olds., 49-55, All G.M. Cars 49-53, State Year, Make and Model.
POSTPAID $1.45

CONTINENTAL KITS

A beautiful high quality, low priced Continental Kit. Styled to complement and blend with the contour of the car. This kit is constructed for durability and trouble free operation. Special design locking device holds kit in rigid position, eliminating any forward or backward motion. Kit folds back allowing easy access to trunk. Carrier is well balanced for easy swing back. Comes complete with Tire Ring, Foot Plate, Chrome Shield, Instructions and all necessary fittings for easy installation. All parts are chrome finished. Specify year, make and model.

49-52 Chevrolet	
49-52 Ford	
49-52 Mercury	
52-57 Studebaker	
1957 Thunderbird	
No. 286—PRIME GRADE	$49.95
No. 330—STAINLESS STEEL RING	$58.95

Specify Tire Size

Overhead Valve Silencer Pad

Silences clicking noises. Lubricates valve rocker arms. Protects against dirt and condensation. Easy to install. State year, make and model of car.
No. 280—Fits Buick 36-55; Chev. & 30-55; Ford 4, 52-55; Merc. Willys 4, 52-55; Olds 31-56 POSTPAID, Each $2.69
No. 281—Fits V8 Cad., Olds. 49-56; Mercury 49-56, Lincoln 53-56, Buick 56-56; Chev. 55-56; Ford 54-56; DeSoto V8, 55-56; Plym. V8, 55-56, Pontiac V8, 55-56; Studeb V8, 51-56.
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'29 GRAHAM-PAIGE 6-cyl. 4-dr. sed. Twin sidemounts, 6 wire wheels, 6 exc. tires. Also driver's manual. $190 firm. George Van Landuyt, Rt. 2, Dundee, Ill. Phone SH 1-8491.

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'48 LINCOLN CONTINENTAL conv. 2nd V-12 engine; o.d., ww's, life guard tubes. New floor mats & radiator. Black; in exc. cond. $2000. J. R. Spencer, 7609 Wildwood Dr., Norfolk, Va.

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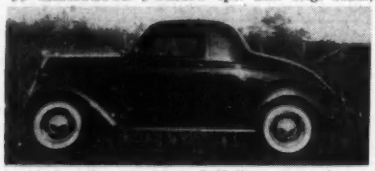

jet black with ww's. $350. J. Kellogg, 1524 Center, Pekin, Ill. Phone 6-0355 after 6 P.M.

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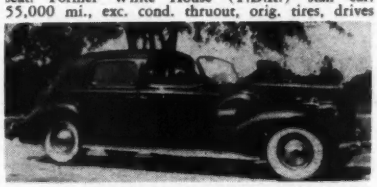

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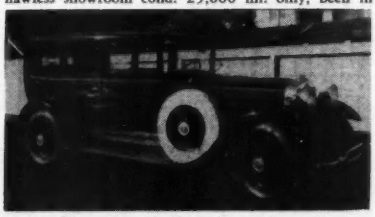

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'37 BUGATTI Type 57 Stelvio drophead cpe. Hydraulic brakes, rubber-mounted engine, De Ram shocks. Recent o'haul, mechanically sound. Needs paint. $1750. H. William Knauz, 1060 N. Western Ave., Lake Forest, Ill.

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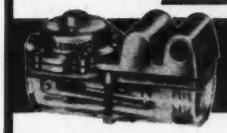

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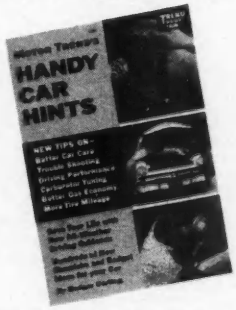

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'28 ROLLS-ROYCE Phantom I Brewster-bodied brougham. Unrestored. 3rd place winner '57 Concours. Spare engine, transmission, tools, manual. Sell or trade. Haggle starts at $1200. Bill Hellie, 2040 Evergreen, Salem, Ore.

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'27 PONTIAC rdstr., mechanically sound & restorable. Send pix if possible & state price. Boyd N. Cathcart, 552 2nd St., Pitcairn, Pa.

PARTS FOR '30 WILLYS-KNIGHT 66-B—hood ornament, window handles, headlights, wire wheels, fenders, steering rods & box—or complete car. Will pay freight or pick up. C. A. Baggaley, 402 Kennedy, Winnipeg, Manitoba, Canada.

'46-'48 LINCOLN CONTINENTAL hdtp. Would prefer it as orig. as possible. Please state year, cond., color & price. M. E. Kriedeman, 1392 47th St., San Diego 2, Calif.

'41 CADILLAC 60 Special Fleetwood parts. Especially need trim parts, window & door moldings in mint cond. from '40 or '41 60-S, also shop manual. What have you? H. G. Hartmann, 117 Eiler Ave., Pittsburgh, Pa. Phone TUxedo 1-7130.

POPCORN STEAM ENGINE. Appreciate leads. Could repair. D. E. Larson, 426 S. Phillippi, Boise, Ida.

'36 AUBURN 851 engine or 851 block & head. Specify mileage, if known, & cond. Frank Friedrick, 813 Richmond Ave., Buffalo 22, N.Y.

SHOP MANUAL, instruction book, service bulletins, specifications, sales catalog, & any other literature to help restore '38 Cadillac Model 75 limousine. D. Anderson, 1209 W. Gore, Lovington, N. M.

4 '39 PACKARD V-12 hubcaps, 2 '39 Packard V-12 hood medallions. Warren Hendricks Sr., 5th & Oak Sts., Perkasie, Pa.

LEFT & RIGHT rear fender boots for '48 Lincoln Continental. Peter V. Watjen, 48 Underwood St., Pawtucket, R.I.

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CHICAGO AUTO SHOW

In order to promote traffic safety, the Chicago Automobile Show to be held January 4-12 is offering $700 in U.S. Savings Bonds as prizes in a slogan contest. Mayor Richard J. Daley will present the awards at the Golden Jubilee Show in Chicago.

JIMMY BRYAN IS NATIONAL CHAMP

Jimmy Bryan won his third National Automobile Racing Championship with a first place finish in the final race of the season, a 100 miler at Phoenix, Ariz., held on Monday, Nov. 11. Bryan drove the Dean Van Lines Spl. home a car length ahead of Pat O'Connor in the Sumar Spl., after a sensational duel with the North Vernon, Ind., driver. Final National Championship point standings for the top three spots went to Jimmy Bryan, Phoenix, Ariz., 1650; Jim Rathmann, Miami, Fla., 1470; and George Amick, Venice, Calif., 1400.

A FIRST FOR FIAT

Prior to beginning sale of its cars in this country, Fiat established a $1 million spare parts U.S. inventory. Now, eight months later, Fiat has just announced a new information service plan. Upon receipt of notification of a new car purchase, Fiat headquarters in New York mails the customer a complete list of how long it takes to do repair jobs of various kinds on Fiats, and an abridged list of spare parts prices, tax included. Data covers 94 repair jobs and 102 spare parts. In addition to improving service for Fiat owners, plan helps alleviate fears of purchasers as to service facilities and spare parts, and cost of repairs.

LOSSES REPORTED BY STUDEBAKER-PACKARD

For the first nine months of 1957, Studebaker-Packard losses were reduced to $12,365,689 on $147,431,550 sales. In order to increase sales, Harold E. Churchill, president of S-P, reported that an extensive advertising campaign has been launched. Prices on the 1958 models have been raised slightly to meet increased production costs, from $19 on the Scotsman to $90 on the Golden Hawk.

DAYTONA SPEEDWAY

The Daytona Beach International Speedway, in planning stage for three years, has been assured of reality following negotiations between area officials and corporation headed by Bill France, NASCAR prexy. Setup will be 2½-mile track with two 1500-foot straights and one 4000-footer. Turns will be banked 30 degrees. Design indicates speeds of 200 mph will be possible. Infield will contain two-mile road course and spectator seating will accommodate 100,000. Construction on 466-acre site will be started almost immediately and completion date is set in time for February 1959 "Speed Weeks."

CARS FROM BEHIND THE IRON CURTAIN

Among the "new" cars currently being made in Moscow is the SIL-111 (upper photo at right), a large seven-passenger sedan similar in appearance to later-year Packards. Ohv V8 has power rating of about 220 hp. Car has power steering, power brakes and automatic transmission. At lower right is Moskvitsch 410, bigger brother of 402 pictured on page 81. Similar to U.S. station wagons in styling (note slanted pillar) the 410 is a four-wheel drive vehicle with greater road clearance and larger wheels than the 402. It uses the same four-cylinder, four-stroke, 74.42-cubic-inch engine. Top speed is listed as 60 mph, with fuel consumption at 21-24 mpg.

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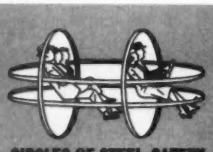
ONLY CAR WITH . . .

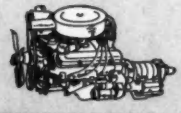
QUADRA-POISE ROADABILITY

made possible by revolutionary new frame design and suspension geometry, virtually eliminates dive, sway and bounce. Only the wheels know where the bumps are and handling's the easiest you've ever known!



CIRCLES-OF-STEEL SAFETY

Pontiac's new body surrounds you with girder steel above, below, front and rear—and floats you on rubber with no metal-to-metal contact. (Same construction in the convertible except for top.)



TEMPEST 305 PERFORMANCE

Scores of exclusive engineering innovations make Pontiac's hefty power plant a miracle of smoothness. Try its jeweled-action response in a choice of six horsepower ratings.

Meet the big change in the low-price field—the bold new Pontiac Chieftain. This completely new kind of car is the result of planning as bold as the car itself. First, the engineers went all-out to perfect scores of revolutionary advances to celebrate the Golden Anniversary of Pontiac and General Motors. Second, they determined that Pontiac's new Chieftain Series could and would be priced right down with the lowest. From its tradition-breaking chassis design to its fully carpeted, color-coordinated interiors, the Chieftain is unlike any other car in its class . . . even to Air Suspension*, Fuel Injection* and Tri-Power Carburetion*! Why not be among the first to own this straight-from-tomorrow newcomer to the low-price field?

*An extra-cost option.

PONTIAC MOTOR DIVISION OF GENERAL MOTORS CORPORATION